

THE FIFTIETH ANNUAL REPORT OF THE
SANITARY COMMISSIONER

AND THE

TWENTY-FOURTH ANNUAL REPORT OF THE
SANITARY ENGINEER,

MADRAS.

1913.

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THE
FIFTIETH ANNUAL REPORT
OF THE
SANITARY COMMISSIONER WITH THE GOVERNMENT
OF MADRAS,
1913.

SECTION V.

GENERAL POPULATION.

RAINFALL.

THE total district rainfall of the year averaged 43.38 inches against 45.93 inches of 1912 and 44.48 inches the average of the 40 years ending with 1909. Compared with the average, there was an increase in 7 districts and a decrease in 18. The excess was over 10 inches in Chingleput (+ 12.66), Madras (+ 16.07), South Arcot (+ 17.42) and Tanjore (+ 13.81), while the decrease was more than 5 inches in Chittoor (- 7.29), Coimbatore (- 6.92), Guntür (- 5.41), Kistna (- 9.20), Kurnool (- 5.58), Madura (- 5.31), Malabar (- 10.73), North Arcot (- 7.25) and South Canara (- 19.52). Compared with 1912, the increase was marked in Madras (+ 18.38), South Arcot (+ 21.58) and Tanjore (+ 22.35) and the decrease in Malabar (- 36.20) and South Canara (- 36.87).

2. Viewed with reference to the monsoons, the south-west monsoon yielded a district average of 22.08 inches and the north-east 17.38 against 25.33 and 17.17, respectively, of the year 1912. Compared with the previous year, the south-west monsoon was unfavourable over the Presidency as a whole. Only six districts showed an excess, the total amount recorded in them being 15.88 inches. The decrease was most marked in Malabar (- 35.64) and South Canara (- 33.34). The shortage in the south-west monsoon in the districts of Chingleput, Ganjam, Godāvari and Madras was, however, counterbalanced by an excess rainfall in them in the north-east monsoon. In 13 districts both the monsoons showed a shortage during the year under report.

3. Of the districts which depend chiefly upon the north-east monsoon, the districts of Chingleput, Madras, South Arcot, Tanjore and Trichinopoly received a rainfall in excess of the previous year and of the average, the districts which showed a shortage being Chittoor, Coimbatore, Madura, Nellore, North Arcot, Rāmnād, Salem and Tinnevelly.

PRICES OF FOOD-GRAINS.

4. The prices of the staple food-grains were nearly the same in all the districts of the Presidency as in the previous year, but were very much above the average years ending 1912-1913. During 1913, rice was sold at 7.4 imperial seers

of 80 tolas per rupee, ragi at 13.5, cholam at 12.7 and cumbu at 12.6 against an average of 9.9, 17.2, 16.9 and 16.2 seers, respectively. These figures represent a rise in prices by 33.8, 27.4, 33.1 and 28.6 per cent. above the average. In no district were food-grains sold at a cheaper rate during 1913 as compared with the average. This is positive evidence that living is becoming dearer now a days.

GENERAL POPULATION.

5. According to the census of 1911, the population of the Presidency was 41,829,282, exclusive of Europeans and Eurasians. The European and Eurasian population excluded from this total amounted to 40,928. The population for which vital statistics were furnished for the year under report was 40,005,735, leaving a total of 1,823,497 souls unaccounted for. These are composed of the hill tribes of the Ganjam district (341,622) and the Vizagapatam district (1,020,077) and the inhabitants of the Laccadive Islands (10,600), of the Banganapalle State (39,343) and of the Pudukkottai State (411,855). The estimated population of the year 1913 is 42,778,652 and its natural growth as ascertained by adding to the census figure of 1911 the excess of births over deaths during the succeeding period up to the end of December 1913 is 42,817,834.

6. The number of emigrants for Fiji, British Guiana, the Straits Settlements, Burma and Ceylon that actually embarked from the Presidency during the year was 440,833 against 405,000 in the previous year. Immigrants (excluding the indentured emigrants) during the year numbered 357,696 or 33,328 more than in the previous year. Emigrants during the year exceeded the immigrants by 83,137.

7. The machinery employed for the registration of vital statistics both in urban and rural areas and the methods adopted for the collection and tabulation of the results secured underwent no change during the year under report.

8. Act III of 1899 was in force in 279 unions and 1,898 villages. Registration in rural areas cannot be considered accurate as the agency employed was quite inadequate for the purpose. Unless Act III of 1899 is made compulsory throughout the Presidency and competent men employed as registrars of births and deaths better results in registration cannot be expected.

9. In mufassal Municipalities, there were 1,362 convictions for failure to report births and deaths, the amount of fines imposed by the magistracy for such failure being Rs. 776-10-0.

BIRTHS IN DISTRICTS.

10. During the year under report a total of 1,288,618 births was registered in the whole of the Presidency against 1,245,465 in 1912, showing an increase of 43,153 births. Calculated upon the census population of 1911 the birth-rates for 1913 and 1912 stood at 32.2 and 30.9 per mille, respectively. Compared with the decennial average of 10 years ending 1912 the recorded birth-rate for the year showed an increase of 0.6 per mille. The increase as compared with the previous year occurred in 15 districts and the decrease in 9, the rates for Nellore being the same in both years. The increase was most marked in Ganjam (+12.2) due evidently to better registration. It was also large in Kāmnād (+5.6), Bellary (+5.0) and Tinnevelly (+4.2). Among the districts which showed a decrease, Gōdāvari (—3.1) headed the list. Judged by the decennial average there was an increase in 18 districts and a decrease in 7, Nellore (+4.1) and North Arcot (+4.0) showing the largest increases and South Arcot the largest deficit (—4.4).

11. The districts which showed largest birth-rates were Guntūr (38.7), Chingleput (38.6), Madras (37.6), Kistna (37.4), Tinnevelly (35.8) and South

Canara (35.0). The lowest rates were returned by Rāmnād (25.4), Madura (27.9), Cuddapah (28.1), South Arcot (29.7) and Gōdāvari (29.9). In the other districts the rates varied between 30.0 in Nellore and Trichinopoly and 34.3 in North Arcot.

12. Considered with reference to sex the proportion of male to female births was 104.5 to 100, the previous year's figures being 104.8 and 100. The difference is very slight. Classified according to race, the birth-rate among Muhammadans was 34.6, among Hindus 32.2 and among Indian Christians 29.9, corresponding rates for the previous year being 33.2, 31.0 and 28.2, respectively.

13. The total number of births registered in 1913 in the 206 rural towns in the Presidency containing over 5,000 inhabitants (excluding Hospet which was newly constituted into a Municipality) was 58,915 against 57,582 in 1912. Calculated upon the census population of 1911, namely, 2,226,321 (1,084,967 males and 1,141,354 females), these figures yielded annual ratios of 26.5 and 25.8 per mille, respectively. As compared with the previous year, there was an increase in 124 towns and a decrease in 81, the rates in Natham being identical. An increased birth-rate of over 15 per mille was returned by Vasudevanallur (+22.4), Tekkali (+19.0), Puliyanakudi (+18.4), Pattamadai (+18.0), Sriperumbudur (+17.8), Dharmapuri (+15.9), and Kaveripatnam (+15.1). The decrease was prominent in Attili (-41.3), Valuru (-39.7), Achanta (-36.0), Nuzvid (-34.7) and Valavanur (-25.3). These large variations point to the conclusion that there was something wrong with the registration machinery in the towns concerned. The birth-rate was highest in Nāmakkal (58.9). Other towns which showed largest birth-rates were Sriperumbudur (57.8), Dharmapuri (54.8), Tanurnagram (48.3), Madurāntakam (47.1), Adanki (43.9) and Bhavāni (43.5). In nine other towns the rates varied from 42.0 in Kōsgi to 40.2 in Vartirāyiruppu. Registration must have been

grossly neglected in the marginally-noted five towns* where the rates recorded were below 10 per mille. Very low rates have been returned for the last 3 years successively by Vempalli, Razampetta and Kattur and no action seems to have been taken by the local authorities to set matters right.

14. According to the census of 1911, the total population of the rural areas in which Act III of 1899 was in force during the year was 6,275,545 and that of the areas where it was not, 31,837,649, the total birth-rates obtained for these populations being 31.8 and 31.9 per mille, respectively. Of the 21 districts where the Act was in force, 10 yielded rates in excess of those registered in the non-compulsory areas. The increase was marked in Salem (+22.1), Rāmnād (+15.2) and Gōdāvari (+12.7). Kurnool and Kistna showed the largest deficits of 18.9 and 14.9 per mille, respectively.

DEATHS IN DISTRICTS.

15. The total number of deaths registered during the year was 856,651 against 982,308 in 1912. These figures represent annual ratios of 21.4 and 24.3 per mille, respectively, against the decennial average rate of 23.8. The death-rate during the year was thus 2.4 below the decennial average and 2.9 below the previous year's rate. As compared with 1912, the increase occurred in three districts and the decrease in 22, the low rates being prominent in Cuddapah (-12.4), Bellary (-11.7), Gōdāvari (-9.3), Kurnool (-7.3) and Vizagapatam (-6.4). The decrease may be chiefly attributed to fewer deaths recorded during the year under "Cholera," "Fevers" and "All other causes."

16. Excluding Madras which recorded a death-rate of 40.3 per mille, the highest death-rates were returned by Malabar (26.5), the Nilgiris (26.2), Tanjore (26.1) and Anantapur (25.5) and the lowest rates by Gōdāvari (16.9), Ganjam and Vizagapatam (17.4 each), Rāmnād (17.5), Cuddapah (17.9), Nellore (18.5), Kurnool (18.8) and Madura (19.6).

17. For every 100 female deaths there were 103.6 male deaths. Racially concerned, the death-rate (23.7) among Muhammadans was the heaviest, as usual, ~~at~~ 27.7 in the previous year. Among Hindus and Indian Christians the rates

GENERAL POPULATION.

were 21.4 and 18.6, respectively, corresponding figures for 1912 being 24.4 and 20.1 per mille.

18. The mortality among children under one year of age averaged 180.0 per mille of registered births during the year against 190.4 in 1912. Distinguished by sex, the rate of mortality of male infants was 189.3 and of female 170.3. Thus for every 100 deaths, there were 53.7 male and 46.3 female deaths, as in the previous year. Compared with 1912 increased death-rates among infants occurred in eight districts, North Arcot (+23.9) heading the list, followed by Madras (+14.5) and the Nilgiris (+12.0). The decrease was marked in Ganjam (-39.9), Nellore (-30.1), Kurnool (-30.0), Malabar (-28.6), Bellary (-27.3) and Cuddapah (297.9) against 283.4 in 1912. Chingleput (214.8), Tanjore (212.5), South Arcot (210.5) and Tinnevelly (200.6) showed also considerably large death-rates.

19. A total of 43,288 deaths was registered during the year under report in the 206 rural towns in the Presidency containing over 5,000 inhabitants, against 49,342 in 1912, excluding the figures relating to Hospet. Calculated upon the census population of 1911 these figures represent annual ratios of 19.4 and 22.2 per mille, respectively, the quinquennial average death-rate being 21.5 per mille. Compared with the previous year there was an increase in 75 towns and a decrease in 129, the rates in Tiruvadi and Nammakkal being the same. The increase was noteworthy in Kadiri (+18.6), Vasudevanallur (+18.5), Ambur (+16.9), Elayangangudi (+14.3), Pallikonda (+14.0) and Alwar Tirunagari (+12.5) and the decrease in Kalyandrug (-26.6), Achanta (-24.1), Attili (-22.7), Yadiki (-21.2), Valuru (-20.5), Tiruvadamarudur (-20.3) and Madakasira (-20.2). The highest death-rates were recorded in Ambur (55.5), Tiruvottiyur (52.0), Kadiri (41.7), Alwar Tirunagari (41.2) and Dharmapuri (40.0). These high rates were due to "Plague" in Ambur, to "Fevers" in Tiruvottiyur, to "Cholera" in Kadiri and to "All other causes" in Alwar Tirunagari and Dharmapuri.

1. Uravakonda	.. 9.8
2. Tirupur	.. 9.4
3. Budvel	.. 9.2
4. Villupuram	.. 9.0
5. Proddatur	.. 8.7
6. Vempalli	.. 8.3
7. Kallakurichi	.. 8.3
8. St. Thomas' Mount	.. 8.2
9. Attili	.. 7.9
10. Kanchi	.. 7.7
11. Pithapuram	.. 7.1
12. Māṇḍādurai	.. 6.9
13. Tiruppattur	.. 6.7
14. Naraspatam	.. 6.4
15. Jammalamadugu	.. 5.8
16. Kātur	.. 5.2
17. Rāvampetā	.. 4.7
18. Samalkot	.. 4.3

20. In the marginally-noted eighteen towns, the death-rates were below 10 per mille. There should be some local factor accounting for such low rates. Defective registration of vital statistics in the towns must have played a prominent part in the results reported.

21. The death-rate recorded in the areas in which Act III of 1899 was in force was 21.1 against 20.6 in the non-compulsory areas. In eleven districts the rates were in excess of those returned from the non-compulsory areas, while in nine there was a decrease, the one remaining district (Vizagapatam) showing identical rates. The increase was large in Rāmnād (+11.9), Salem (+11.5) and Gōdāvari (+11.4) and the decrease in Kurnool (-10.1), Kistna (-6.5) and Anantapur (-5.2).

BIRTHS IN MUNICIPALITIES.

22. Including Hospet which was constituted a Municipality during 1913, there were 63 towns in the Presidency under municipal administration where compulsory registration of births and deaths was enforced by the employment of special staffs. These towns contained an aggregate population of 2,605,074 (1,298,273 males and 1,306,801 females) according to the census of 1911. The total number of births registered during the year under report in these areas was 96,419 against 94,543 (including the births returned by Hospet) in 1912. These figures yielded annual birth-rates of 37.0 and 36.3 per mille, respectively, against the quinquennial average of 36.8 per mille. Compared with the birth-rate returned for the year in rural areas, the municipal rate showed an excess of 4.8 per mille due, no doubt, to better registration obtaining in municipal towns. As compared with the previous year, 41 municipal towns showed an increased birth-rate. The increase was noteworthy in Adōni (+22.9), Bellary (+10.0) and Vāniyambādi (+10.0), the reason given for this result being that after the plague scare had subsided in these towns, people returned to their homes freely.

23. Twenty-one towns showed a decrease, the prominent among them being Gudiyāttam (-8.7), Tiruppattūr (-8.4) and Cocanada (-8.3). Kumbakōnam showed the same birth-rate (27.9) in both years. Compared with the quinquennial average the falling-off was most marked in Gudiyāttam (-13.0) obviously due to defective registration there. The highest birth-rates were registered in Salem (55.3), Ellore (52.8), Bellary (52.0) and Tiruppattūr (51.2). In 13 other towns the rates were also large varying from 40.5 in Chingleput to 49.6 in Palni. The birth-rate varied from 40 to 30 per mille in 36 towns and from 30 to 25 per mille in 9 towns. The lowest rate was returned by Gudiyāttam (21.5).

24. I doubt whether registration of vital statistics is carried on satisfactorily even in municipal towns. The question of improving registration in these areas by entrusting the work to private medical practitioners on payment of a small remuneration is now engaging the attention of Government (Memorandum No. 401-M., dated 25th February 1914).

DEATHS IN MUNICIPALITIES.

25. The deaths registered in municipalities during the year numbered 83,121 against 88,663 (including the deaths returned by Hospet) in 1912. These figures represent annual ratios of 31.9 and 34.0 per mille, respectively, the quinquennial average being 34.7 per mille. The fall in the death-rates during the year occurred chiefly under "Cholera" and "Fevers." In contrast with the results of the previous year, the death-rate showed an increase in 17 towns and a decrease in 45, the remaining town Karur returning the same rate of 30.3 per mille. The largest rates were returned by Tiruppattūr (+14.7), Coimbatore (+12.8) and Palni (+12.2). The heavy mortality in the towns of Tiruppattūr and Coimbatore was due to the prevalence of plague. In Palni cholera accounted for a larger number of deaths. The diminution was striking in Vāniyambādi (-38.8), Gudiyāttam (-35.0), Parlakimedi (-19.6), Anantapur (-16.7) and Cuddapah (-16.1). The comparatively low rates in Vāniyambādi, Gudiyāttam and Cuddapah were due chiefly to fewer deaths from "Cholera" and "Plague" in them. In Parlakimedi and Anantapur "Cholera" was less prevalent during the year under report and this accounted for the low rates recorded. Considered with reference to the quinquennial average, the death-rate showed an increase in 15 towns and a decrease in 47, the remaining town of Cuddalore returning the same rate of 28.8 per mille. Tiruppattūr with a death-rate of 81.1 headed the list, followed by Palni with 61.9 per mille. Death-rates were also high in Coimbatore (43.7), Bellary (43.5), Madras (40.3), Calicut (37.4) and Tinnevelly (35.3). The mortality rates varied from 30 to 35 per mille in 21 towns and from 20 to 30 per mille in 31 towns. The lowest rates were returned by Cuddapah (19.3), Bimilipatam (19.3), Gudiyāttam (19.4) and Rajahmundry (19.9).

26. The total average infantile mortality in the municipalities during 1913 was 238.8 per mille of registered births against 248.2 in 1912. Considered with reference to sex, the mortality among male infants was 252.9 and among female 224.0, or, in other words, in every 100 infantile deaths there were 54.3 males and 45.7 females. Compared with the previous year, there was an increase in 20 towns and a decrease in 43. The increase was over 30 per mille in Hospet (+113.2), Palni (+41.4), Palamcottah (+34.4), Nellore (+33.3), and Tinnevelly (+31.3), while the towns which showed noticeable decreases were Masulipatam (-124.9), Adoni (-114.6), Wallajapet (-85.3), Vāniyambādi (-84.9), Chidambaram (-82.2), Kodaikānal (-75.1), Ellore (-62.8), Parlakimedi (-61.4) and Anantapur (-60.7). Palni returned the highest mortality, viz., 335.9 per mille, followed by Guntūr (319.3), Madras (297.9), Ellore (296.6), Coimbatore (282.7) and Negapatām (276.6). The rate varied from 150 to 275 per mille in 50 towns. Infantile death-rates were lowest in Bimilipatam (120.6), Tellicherry (121.7), Cuddapah (130.3), Mangalore (135.1), Cannanore (136.2), Calicut (145.8) and Vāniyambādi (149.1).

SECTION VI.

GENERAL HISTORY OF CHIEF DISEASES.

CHOLERA.

27. Compared with the previous year, cholera was not so prevalent during the year under report. In 1913, deaths from this cause numbered 37,730 against 92,497, representing annual ratios of 0.9 and 2.3 per mille, respectively, the quinquennial average being 1.9 per mille. In 17 districts, it was a continuation of the epidemic that prevailed in the previous year. During the year, the disease was reported from all the districts of the Presidency and was present all the year round in no less than nine districts. Anantapur and Tanjore suffered most with death-rates of 4.7 and 2.5 per mille, respectively. Compared with 1912, Bellary, Cuddapah, Ganjam and Gôdâvari returned a smaller number of deaths, the mortality rates in these districts being 1.0, 1.2, 0.3, 0.04, respectively, against 8.3, 7.3, 4.6, 3.1 per mille in the previous year. The incidence of cholera mortality was heaviest in the months of January, February, July and December.

28. From 43 mufassal municipalities 1,700 deaths from cholera were reported against 4,811 in 57 towns (including Hospet) in 1912. Rajahmundry, Coonoor, Gudiyattam and Salem towns returned only one sporadic case each, Chingleput, Cuddapah, Chicacole and Mangalore two each, and Conjeeveram and Berhampur three each, during the year under report. The heaviest mortality from this cause was recorded in Palni, the death-rate there being 19.0 per mille against 5.7 per mille in the previous year. The death-rates were also large in Cochin (5.7), Anantapur (4.5), Karur (3.6) and Tinnevelly (3.3). As compared with the previous year, the towns of Vaniyambâdi and Tiruppattur showed the largest decreases of -22.6 and -18.5 per mille, respectively. Nineteen municipal towns were free from the disease during the year under report.

29. Out of 44,056 towns and villages in the Presidency, deaths from cholera were reported from 4,892 as against 8,562 in 1912.

30. The rules for combating cholera published with G.O. No. 1536 M., dated 9th September 1896, continued to be in operation throughout the year. The Chairmen of the Municipal Councils concerned acted upon the timely warnings and advice given by this office. In the case of towns to which the rules have not been extended, advice was given to employ the additional staffs, etc., on the scales prescribed in these rules in the interests of public health. It is satisfactory to note that such advice was readily and willingly acted upon.

31. The two reserve parties of sanitary inspectors to check the spread of outbreaks of cholera recently sanctioned by Government have been formed since the close of the year. Their operations are practically confined to rural areas and their working is closely watched by this office. It is too soon to say anything of their utility. In the districts in which they have worked, the disease showed signs of abatement before they had been long in them. This may be pure coincidence. Without more experience it is impossible to say whether the parties will prove a success or not. One thing is apparent; the two parties are not enough for the Presidency. There should be more parties even for experimental purposes and the Government will no doubt consider the desirability of adding some more parties, at least two more, to the present number.

32. Permanganate of potash as a means of purifying contaminated sources of water-supply was freely used and continued to be favourably reported on by local medical officers.

33. Since the introduction of piped water-supplies, the mortality from cholera in towns which have a protected water-supply has been continuously on the

decrease. This fact is patent from statement No. XIII appended to the report. The high mortality from this disease in Palni, a town of pilgrimage and noted for festivals, emphasises the necessity of the early introduction of a protected water supply there. Information from a reliable source attributes the spread of the disease in the West Coast districts during the current year to the festival at Palni and every effort should be made to push forward a protected water-supply scheme for this town. The municipal town is a small one and will require assistance to meet the cost. Provision of protected wells as sources of drinking-water along the main pilgrim routes in this Presidency would, in my opinion, considerably reduce the number of deaths from this disease and curtail its spread.

SMALL-POX.

34. Small-pox contributed 14,802 deaths against 16,094 in 1912, representing an annual ratio of 0·4 per mille against the quinquennial average of 0·5 per mille. The disease was reported from all the districts of the Presidency and was continuously present throughout the year in all of them. Only one district, namely, Coimbatore, returned the highest death-rate of one per mille. As vaccination in this district has been backward during recent years, it was thought a change of personnel in the vaccination staff would show better results. Some transfers of Deputy Inspectors of Vaccination and Vaccinators have consequently been effected and it is hoped that with these changes, vaccination would show improvement in the district under notice. Of the deaths registered under this head, 6,674 were under one year of age and 4,617 from 1 to 10 years of age, or 45·1 and 31·2 per cent., respectively, of the total mortality against 39·2 and 30·9 per cent. in 1912. The death-rate among the young during the year was thus higher. It is not possible to reduce this high mortality amongst these subjects unless vaccination is made compulsory throughout the Presidency. The combined system of compulsory vaccination with compulsory registration of births and deaths was looked upon as a solution of the difficulty. The Government, however, have abandoned the scheme of extending the system throughout the Presidency observing that "there are large areas in which its introduction would for the present be inadvisable" (G.O. No. 1814 L., dated 24th October 1913). Sooner or later this compulsory system must be brought about and I am convinced that unless this is done, things will be as unsatisfactory as ever.

35. Seventeen municipal towns enjoyed complete immunity from this disease during the year under report against 27 municipal towns in the previous year. In the remaining 46 towns a total of 855 deaths was registered. In 19 towns where it was prevalent the number of deaths reported did not exceed 4 in each. The death-rate was highest in Guntur (2·6), followed by Mannargudi (2·3) and Cochin and Anakapalle (2·0 each).

36. From 3,907 towns and villages small-pox cases were reported against 3,653 in the previous year. In municipal areas the death-rate from this cause was 0·3 per mille while in rural tracts it was 0·4 per mille. The low mortality in urban areas is clearly due to the system of compulsory vaccination obtaining in them.

PLAQUE.

37. During 1913, plague caused 5,130 deaths in 17 districts against 6,651 in 16 in 1912, yielding annual ratios of 0·1 and 0·2 per mille, respectively. Eight districts were completely free from the disease; while in five, there were in all 9 imported cases. In the remaining 12 districts from which indigenous cases of plague were reported, the death-rate was largest in Coimbatore (1·0), followed by North Arcot (0·9) and Bellary (0·6). The disease was present all the year round in the districts of Bellary, Coimbatore and South Canara. As compared with the previous year, Bellary showed the largest decline (-1·3 per mille); also the Nilgiris (-0·7 per mille).

38. One thousand seven hundred and eighty-five deaths from plague were reported during the year from 21 municipal towns against 1,858 from a like number (including Hospet) in 1912. Tellicherry, Cannanore and Bimilipatam returned one imported fatal attack each, Bellary, Conjeeveram, Walajapet, Salem and Trichinopoly two each and Tirupati, Madras and Vāniyambādi three each. The disease was present in an indigenous form in the remaining 10 towns, the total number of deaths reported from them being 1,763. The largest death-rate was recorded in Tiruppattūr (44.3). The death-rates from this cause were also heavy in Coimbatore (12.7), Hospet (6.8), Mangalore (5.8) and Gudiyāttam (5.6). As compared with 1912, Gudiyāttam and Vāniyambādi towns showed the largest decline of -13.7 and -17.4 per mille, respectively.

39. Deaths from plague were reported from 635 towns and villages against 473 in the previous year.

40. As usual the measures adopted for fighting the disease were the employment of observation and preventive staffs in and about the affected areas, disinfection of infected houses and of persons and their effects, segregation of patients and contacts, passporting persons arriving from infected areas and keeping them under surveillance for a period of seven days, destruction of rats by poison-willing to undergo the operation.

41. Ninety-one deaths from plague (Anantapur 1, Vizagapatam 1, Cuddapah 2, the Nilgiris 3, North Arcot 5, Bellary 9, and Coimbatore 70) were recorded during the year under report among persons who had been previously inoculated with anti-plague vaccine against 71 in 1912.

42. Since the close of the year, the old passport system has been replaced by the "notification system." The details of the new system is explained in Memorandum No. 1824-1 P., dated 11th October 1913, printed in G.O. No. 218 P., dated 31st March 1914. This system came into force on 1st June 1914.

FEVERS.

43. A total of 268,024 deaths from fevers was registered during the year against 306,471 in 1912. These figures represent annual ratios of 6.7 and 7.6 per mille, respectively, the quinquennial average being 7.8 per mille. The largest death-rates were registered in Vizagapatam (15.3), Ganjam (12.8), Kurnool (11.6) and Guntūr (10.5). As compared with the quinquennial average there was a decrease in 21 districts and an increase in 3, Bellary returning the same rate of 2.4 per mille. Cuddapah showed the largest decrease of 8.4 per mille. Deaths from this cause were numerous in the cold weather months of the year. The largest number (27,110) was recorded in January. In December also there were 25,979 deaths.

44. Twelve thousand six hundred and sixty-five deaths from this cause were registered in the Municipal towns against 14,281 (including Hospet) in 1912 representing annual ratios of 4.9 and 5.5 per mille, respectively. The mortality ratio was largest in Kurnool (15.6) as in the previous year. It was also large in Tirupati (9.1), Tenāli (9.0) and Ellore (8.8). In 22 towns the death-rates varied from 5.0 in Vizagapatam to 8.4 in Nandyal and Vizianagram. As compared with the previous year an increase occurred in 19 towns and a decrease in 42, Madras and Tinnevelly returning the same rates of 7.5 and 2.3 per mille, respectively. Fever mortality in Cuddapah town showed a decline from 4.5 to 2.1 per mille, due evidently to the prohibition of wet cultivation in and around the town and to the anti-malarial operations undertaken during the year at the instance of Major Ross.

45. Out of 44,056 towns and villages in the Presidency, 25,477 reported deaths from this cause against 24,242 in 1912.

MALARIA.

46. Major T. S. Ross, I.M.S., and Captain J. H. Horne, I.M.S., continued to be in charge of malarial operations in the Presidency during the year under report. Major Ross visited several malaria-stricken spots and conducted investigations. The places visited by him during the year were Cumbum and Sidhapuram in the Kurnool district, Waltair and Koraput in the Vizagapatam district, Lower Palnis in the Madura district, the Anamalais in the Coimbatore district and Kallichedu in the Nellore district. His reports clearly show that there is malaria in each of the places visited; and his recommendations for mitigating the evils consequent thereupon were duly forwarded to Government with the support of the Malaria Board. Major Ross paid also flying visits to Ennore to see how the anti-malarial operations started in that area in previous years were progressing. He is confident that, if all his recommendations were given effect to systematically, the disease will completely disappear from Ennore. He also visited Cuddapah with the Piscicultural Expert with the Government of Madras, in connection with the stocking of wells, tanks, etc., there with larvæ-eating fish.

47. Captain Horne conducted a *stegomyia* survey of the ports of Madras, Negapatam and Tuticorin during the year 1913, and his report on the subject was duly forwarded to Government. He also visited Wynnaad, an intensely malarious area in the Malabar and Nilgiri districts, in order to ascertain the practicability of an anti-mosquito campaign on the estates and in the villages adjoining. The remedial measures suggested by him were communicated by the Malaria Board for the favourable consideration of Government. Other places visited by him during the year were (1) a malarious strip along the Nellore Coast about 30 miles long where the conditions are very similar to those obtaining at Ennore, and (2) places reported to be malarious in and around Penukonda in the Anantapur district.

48. Two classes of instruction were also held by Captain Horne during the year—one of three weeks' duration for Assistant Surgeons selected for *stegomyia* survey duty and the other a six weeks' course on malaria for Sub-assistant Surgeons to be deputed for duty with travelling dispensaries in malaria-affected districts of the Presidency.

49. Both the Special Malaria officers did useful work during the year under report and deserve credit for the efficient way in which they carried out the malaria investigation work entrusted to them.

DYSENTERY AND DIARRHŒA.

50. Under this head were registered 65,711 deaths in 1913 against 71,913 in 1912, representing annual ratios of 1.6 and 1.8 per mille, respectively. Madras headed the list, as usual, with a mortality rate of 10.2 per mille. It was the highest on record. Death-rates from these causes were also high in the Nilgiris (4.8) and Malabar (3.9). As compared with the previous year there was an increase in 4 districts and a decrease in 15, the death-rates in the remaining 6 districts being identical.

51. In municipalities 14,007 deaths from these causes were recorded during the year against 14,616 (including the figures returned by Hospet) in 1912, yielding annual ratios of 5.4 and 5.6 per mille, respectively. The towns which returned the largest death-rates were Madras (10.2), Periyakulam (9.7), Calicut (9.2) and Palamcottah (8.5). In 16 towns the rates varied from 5.0 in Cochin to 7.8 in Erode. Compared with the previous year there was an increase in 21 towns and a decrease in 37, the rates in the other remaining towns being the same. Compared with the rural death-rate (1.4) the municipal rate showed a large increase of 4.0 per mille. This may be attributed to the greater accuracy in registration secured in municipal towns.

52. Deaths from dysentery and diarrhœa were reported from 11,580 towns and villages against 11,214 in 1912.

RESPIRATORY DISEASES.

53. The deaths registered under this cause aggregated 38,327 against 38,616 in 1912, representing annual ratios of 1·0 and 0·9 per mille, respectively. The death-rate was largest in Madras (5·3) as in previous three years. It was also large in the Nilgiris (3·0) and Anantapur (2·0). As compared with the quinquennial average there was an increase in 16 districts and a decrease in 3, the rates in the remaining districts being identical.

54. In municipalities a total of 6,546 deaths was registered against 6,339 (including deaths returned by Hospet) in 1912, the annual ratios being 2·5 and 2·4 per mille, respectively. The death-rates were largest in Coonoor (7·8), Cochin (7·4), Bellary (7·2), Tellicherry (6·8), Ootacamund (6·0) and Madras (5·3). In 15 towns no deaths from this cause were reported.

55. Out of 44,056 towns and villages 8,981 returned deaths from this cause against 8,367 in 1912.

INJURIES.

56. The casualties under this head amounted to 10,445 which are 412 more than those recorded in 1912. The death-rate from this cause averaged 0·3 per mille. The mortality rate for the municipalities was also 0·3 per mille. As usual, suicides among females were more frequent than among males, the proportion being 121·8 female to every 100 male deaths.

57. Separate figures were first obtained during the year under report about mortality from "Rabies." There were 140 deaths from this cause throughout the Presidency including municipal towns, the number registered in municipalities alone being 33.

ALL OTHER CAUSES.

58. Deaths under this head numbered 416,482 against 440,033 in 1912, the annual ratios being 10·4 and 10·9 per mille, respectively. Nearly one-half of the total number of deaths registered during the year was shown under this elastic head. The death-rate exceeded 10 per mille in 14 districts. Of the 11 districts which showed a death-rate of below 10 per mille, comparatively fewer deaths under this head were registered in Vizagapatam (1·3), Ganjam (2·3), Kurnool (5·0) and Cuddapah (5·6), while the death-rates recorded in these districts under "fevers" were proportionately large. These districts being notoriously subject for malarious infection, deaths appear to have been freely registered under "fevers" without any attempt at an enquiry into the correct cause of death.

59. In municipal towns the death-rate under this head was 17·1 against 17·2 in 1912. It exceeded 20 per mille in 21 towns and was between 10 and 20 per mille in 37 others. The highest rate was recorded in Palni (37·0) and the lowest in Vizianagram (5·8).

SECTION IX.

SANITARY WORKS—CIVIL.

MUNICIPALITIES.

60. The District Municipalities Act was in force in 63 municipalities with an aggregate population of 2,605,074; two major unions, viz., Tiruvalur and Hospet, were constituted municipalities during the year but the former was not brought under the practical operation of the Act until the current year.

61. Except in the towns provided with a piped water-supply system the condition of water-supply was much the same as in the previous year, the chief sources being wells, tanks, rivers and irrigation channels. Encouraged by the liberal grants given by Government for the improvement of water-supply, Municipal Councils have shown considerable enterprise in endeavouring to secure as pure a supply as possible by abandoning objectionable sources of supply and replacing them by protected wells according to type design, improving existing sources in the case of wells by providing parapet walls, platforms and lead-off drains or otherwise altering them to conform as nearly as possible to type design and in the case of tanks by conserving them in the manner laid down in the Proceedings of the Sanitary Board No. 281/S., dated the 4th May 1912, which, although by no means ideal, affords a fair measure of protection and would be better than nothing especially where wells are not feasible; it is more appropriate for rural areas for which it was primarily intended but has been recommended in the case of certain municipalities where wells yield brackish water and the people show a preference for tanks. Protected wells of one or other of the designs issued by the Sanitary Board must for a long time to come be the only resort in those municipalities that are too poor to finance a piped system and it is towards the furtherance of this object that municipal expenditure should be directed. The quarterly analysis of Municipal water-supplies at the King Institute has been temporarily suspended owing to the pressure of work resulting from the installation of the experimental filters at Guindy.

62. Ootacamund is still the only mufassal municipality which has a comprehensive drainage scheme, but the Municipal Council of the town has not taken full charge of the works, a portion being still in the hands of the Public Works Department. Proposals for improving this system are under consideration. Elsewhere progress has been slow except in Madura and Vellore where the sanctioned schemes have proceeded to execution. In none of the other towns where sewerage schemes have been accepted have the schemes advanced beyond the preliminary stages. The condition as to sewage in municipalities is consequently very unsatisfactory and in need of speedy remedy. The only alternative is to fall back upon temporary make-shift arrangements which Municipal Councils are adopting wherever possible to ameliorate conditions by improving existing drains; but the total result is not much. Government have declined, and very rightly, to make grants for the construction of isolated drains unless they formed part of a comprehensive scheme with sewage disposal works, etc. I have discussed the question of open *versus* underground drains and in a joint note with the Surgeon-General I have laid before Government the future policy to be observed in providing for the drainage of towns. Drainage schemes especially in towns

provided with a piped water-supply should be expedited, but I do not see how this is possible with the present engineering staff. The question of increasing the number of Sanitary Engineers is therefore one that should be early considered.

63. The following statement shows the position of municipal water-supply and drainage schemes during the year :—

Water-supply schemes.			Drainage schemes.				
Opened.	Sanctioned.	Under execution.	Under investigation ; investigation ordered or plans and estimates submitted or being revised under orders.	Opened.	Sanctioned.	Under execution.	Under investigation ; investigation ordered or plans and estimates submitted or being revised under orders.
Adoni. Bezwada. Cocanada. Conjeeveram. Coonoor. Cuddapah Dindigul Gudiyattam. Guntur.	Chingleput. Kodaikanal. Kumbakonam (partial). Kurnool. Madura. Nellore. Ootacamund. Periyakulam. Salem. Tanjore. Tirupati. Trichinopoly. Vellore. Vizagapatam.	Borhampur. Chidambaram. Dindigul improve- ments. Ellore. Kurnool improve- ments. Masnli- patam. Negapatam. Vizianag- ram.	Adoni improve- ments. Anantapur. Bellary. Calicut. Chicacole. Cochin. Coimbatore. Conjeeveram improvements. Coonoor improvo- ments. Cuddalore. Cuddapah im- provements. Erode. Guntur improve- ments. Kumbakonam (2n1 borehole). Madura improve- ments. Mangalore. Mannargudi. Nandyal. Ongole. Palni. Parlakimedi. Rajahmundry. Srirangam. Tanjore improve- ments. Tirupati improve- ments. Tiruvannamalai. Trichinopoly improvements. Vizagapatam im- provements.	Ootaca- mund.	Nil.	Madura. Vellore.	Adoni. Anakapalle. Bellary. Berhampur. Bezwada. Calicut (partial).- Chidambaram. Chingleput. Cocanada.
							Cochin. Cuddapah. Ellore. Erode. Guntur. Kumbakonam. Kurnool. Mangalore. Nandyal. Negapatam. Nellore. Ootacamund im- provements. Parlakimedi. Periyakulam. Rajahmundry. Salem. Srirangam. Tanjore. Tenali. Tiruvallur. Trichinopoly.

¹ Officially opened in January 1914.

64. As regards rubbish and nightsoil conservancy most municipalities still cling to the contract system much to the detriment of effective conservancy. The departmental system showed a slight improvement during the year ; it has been newly introduced in Kumbakonam and in one ward of Trichinopoly where arrangements for extending it to two other wards also are under consideration. In Tanjore where both systems are in force thus affording opportunities for comparison, it is contemplated to replace the contract system by the departmental. It is regrettable that an attitude of utter indifference prevails with regard to this system and that efforts are not made to adopt it on a larger scale. It may not perhaps be financially possible to adopt it wholesale in many of the towns, but there should be little difficulty, I imagine, in the way of its gradual introduction ward by ward as far as funds will permit. If the available balances be carefully scrutinised I feel sure it will be found to be within the capabilities of most municipalities. Provision should be made in the annual budgets for the purchase of as many bullocks as funds will permit and so gradually abolish the contract system

with all its disadvantages. In Negapatam, Adoni, Tuticorin, Palamcottah, Tinnevelly, Berhampur and Chicacole the departmental system is worked with good results and there is no reason why similar success should not be achieved elsewhere.

65. As a result of instructions conveyed from time to time during my inspections a considerable improvement is observable in the stacking and trenching of rubbish and nightsoil and the management generally of the depots. The income realized from the sale of town sweepings and nightsoil was good in the towns of Madura, Vellore, Cuddalore, Tanjore, Adoni, Srirangam, Nellore, Kurnool, Palamcottah, Rajahmundry, Guntur, Karur, and Ellore, fair in Tinnevelly, Conjeeveram, Coimbatore, Trichinopoly, Cuddapah, Salem, Anantapur, Periyakulum, Ongole, Negapatam, and Erode and insignificant in the rest. Much better results might perhaps be secured if the rubbish and nightsoil depots were parcelled out and sold in convenient lots instead of as a whole ; this would enable the small ryot to bid as well as the rich and thus stimulate competition. The practice of cultivating the nightsoil trenching ground is not generally pursued and the ground is allowed to lie fallow in towns where there is no demand among the ryots for nightsoil, much valuable matter thus going to waste. The trenching ground, however, was cropped in the Municipalities of Vizianagram, Cocanada, Palni, Tuticorin and Bellary and reports show that except in Bellary the crops raised grew luxuriantly and were of good quality which fact should serve as an object lesson to the ryots who have a prejudice against using nightsoil on their fields. If other towns followed their example much of the prejudice now prevailing would, I imagine, disappear.

66. During the year instructions were issued in G.O. No. 1678 M., dated the 1st September 1913, for the disposal of rubbish by screening and incineration ; but orders were not received in time to be largely availed of before the close of the year. It is hoped that Municipal Councils in towns where the income from the sale of rubbish is small owing to little demand for rubbish for agricultural purposes will see their way to adopting this system which, if properly carried out, is not only economical as to staff and plant but also of immense value in reclaiming ponds and low-lying places.

67. There was a general increase in the strength of the menial conservancy staff, in the number and quality of the plant, latrines and dust bins, which should ensure a more rapid and satisfactory removal of nightsoil and rubbish from the town site and the prevention of indiscriminate fouling of the town site. Deficiencies, in some cases to a considerable extent, exist in individual municipalities, but these are being made good gradually as they are brought to notice in reviewing the budget estimates.

68. The Supervising staff however shows a falling off ; but the decrease so far is a satisfactory feature as it occurs entirely among the menial staff of peons and maistries whom Municipal Councils show a tendency to employ in unduly large numbers. I should prefer to see their number still further reduced and the saving thus effected utilised for increasing the strength of sweepers and toties and in improving the plant. There was however a larger number of Sanitary Inspectors and Sanitary Overseers employed in 1913 than in the previous year, viz., 156 and 47, respectively, against 146 and 37. The increase in the number of the former is satisfactory so far and indicates that this class of subordinates is advancing in popularity. It is hoped that this preference for skilled supervision will be maintained and that Sanitary Inspectors will be employed in the proportion and on the salaries prescribed in G.O. No. 901 M., dated the 9th June 1911, in several of the Municipalities where they are still not so employed. As a result of the repeated orders of Government and the representations made by this office, Sanitary Inspectors have now been relieved to a great extent of duties unconnected with sanitation with which they were formerly saddled, thus enabling them to pay greater attention to their legitimate duties. But the sanitary duties of Municipal Sanitary Inspectors had not hitherto been defined and the result was that these subordinates went about with the vaguest idea of what they should and what

they should not do. These duties have now been clearly defined and the rules drawn up for the guidance of Sanitary Inspectors await the sanction of Government.*

69. I do not regard the increase in the number of Sanitary Overseers, who are unqualified men, with equanimity as I am not satisfied that their employment is at all justifiable in the presence of peons and maistries; I consider it a sheer waste of money to employ both classes of subordinates and I have frequently brought this to notice in transmitting proposals for the revision of municipal sanitary staffs. Sanitary Overseers are no other than glorified peons with little to do save as unnecessary intermediaries between the Sanitary Inspectors and the peons and maistries; there can be no objection to their employment provided their duties were confined solely to the supervision of the menial conservancy staff to replace the inferior men now employed; but as at present constituted they stand on debatable ground and are very frequently, for one reason or another, thrust into positions and are assigned duties which pertain only to qualified Sanitary Inspectors and they are thus employed for prolonged periods much to the detriment of sanitary work. Either the peons and maistries or the so-called Sanitary Overseers should disappear from the nomenclature of municipal sanitary organisations. The question of the agency to be employed for supervising the menial conservancy staff is under consideration by Government and when this is decided it is hoped that this defect will no longer exist.†

70. Although the number of public latrines rose in the aggregate from 1,547 in 1912 to 1,637 in the year under report, in 22 towns however the public latrine accommodation fell short of requirements; of these the most backward were Calicut, Madura, Palamcottah, Rajahmundry, Masulipatam, Palghat, Srivilliputtūr, Tiruvannāmalai and Hospet.

71. It is hoped that when the latrines for which grants have been made by Government are constructed, the deficiencies now existing will disappear. There was an increase in the number of type-design latrines; but it is curious to note that whilst Municipal Councils have reduced the number of brick and mud walled enclosures the more objectionable form of taty enclosures show an increase of 14. All forms of enclosures should be abolished and replaced by latrines on the type design issued by the Sanitary Board. The question of the most suitable form of latrine was discussed during the year, and as a result the Sanitary Board whilst retaining the existing forms have issued a cheaper design of open corrugated iron latrine leaving it to local bodies to adopt whichever form suited their requirements best.

72. The private scavenging service was in force in all the municipalities and showed an advance when compared with the previous year, the number of private latrines under municipal service having risen from 110,092 to 116,939 or an increase of 6.2 per cent. The improvement was most noticeable in the towns of Chidambaram, Mannārgudi, Tuticorin, Nandyal, Cuddapah, Tiruvannāmalai and Tellicherry. It is obvious that a large number of houses have no backyard latrines and that very little use had been made of section 207 of the District Municipalities Act. The private latrine accommodation was only 40.5 per cent. of the houses of a class that should possess latrines.

73. Sewage farming was in force in the municipalities of Chicacole, Vizianagram, Anakapalle, Rajahmundry, Bezwada, Guntūr, Tanjore, Kumbakōnam, Negapatam, Mannārgudi, Periyakulam, Dindigul, Tinnevelly, Tuticorin, Karur, Nandyal, Salem and Ootacamund, but little improvement is noticeable either financially or otherwise in most of them. Municipal Councils seem to evince little interest in this profitable and effective method of disposing of the town sullage; for, in spite of advice, the farms are badly laid out and mismanaged. In many instances it is impossible to recognise the site as a sewage farm. No attempt at treatment is made except in Salem where bacterial filters are used and in Ootacamund where disposal works connected with the sewerage system exist. The septic tank and the sewage farm in the latter town have not been working satisfactorily for some time and proposals for improving them are

* NOTE.—Orders have since been passed (G.O. No. 760 M., dated 16th April 1914).

† NOTE.—Orders have since been issued which contain no provision for Sanitary Overseers. The employment of peons and maistries has been recognised (G.O. No. 760 M., dated 16th April 1914).

under consideration. In Vizagapatam, Tanjore and Ootacamund the farms proved profitable concerns but in most other towns they were either worked at a loss or the income was insignificant and not worth considering.

74. The assignment made from municipal revenues for expenditure on sanitation amounted to 46.6 per cent. of the aggregate income of all municipalities and was less than that in the previous year. This is probably due to the liberal grants made by Government in consequence of which municipal funds that might otherwise have been allotted to sanitation were diverted to other purposes. The smallness of the provision was most noticeable in the towns of Anantapur, Kodaikanal, Hospet, Chicacole, Mayavaram, Nellore, Palghat, Wallajapet and Ongole where the sanitary allotment ranged from 17.8 per cent. in Kodaikanal to 29.3 per cent. in Ongole. As regards expenditure, however, it is satisfactory to note that a larger proportion of the allotment was spent during the nine months of the year for which figures are available. In 15 towns the expenditure exceeded 75 per cent. of the allotment; whilst in 47 others it was below 75 per cent., so that the balance was either spent in the remaining three months or had lapsed. The worst cases were Ongole, Karur, Masulipatam and Srivilliputtur where the expenditure did not amount to even 50 per cent.

75. The work of opening out congested areas and providing extension sites for housing evicted people has not so far made any but slow progress owing to the hesitancy of Municipal Councils to adopt the radical method desired by Government and the various stages of unpreparedness in which the schemes are submitted for want of an efficient engineering staff to draw up intelligent plans. Instead of dividing the congested town into convenient blocks and dealing with them in the manner indicated in the order of urgency as far as funds permit, compromises are substituted which afford only partial or no relief at all and what with defective plans and the absence of detailed particulars much delay has occurred and schemes were thus left as they were for long periods unfit for consideration by Government. With the skilled engineering staffs which Government have directed Municipal Councils to employ and to which reference was made in paragraph 67 of last year's report and a better appreciation of the importance of proceeding in a more systematic and businesslike manner on the lines indicated by Government, it is hoped that matters will be expedited in future. During the year rules were prescribed for the laying out of extension sites and the construction of huts and sheds; and certain by-laws were also drawn up to regulate the construction of buildings which Municipal Councils were requested to adopt with such modifications as local conditions required. These should be of considerable help to Municipalities in proceeding in a regular and orderly way; but unfortunately the matter does not end there. The difficulty is with reference to completed schemes and the prevention of opened out areas and new extensions becoming again congested. Under the existing enactment Municipal Councils seemingly have little power and find themselves tied down in this respect. I apprehend grave difficulties will arise sooner or later when opening up and town planning schemes are undertaken on anything like the lines discussed at the All-India Sanitary Conference unless at the same time the Municipal Executive be armed with larger powers to afford them the necessary control. Suitable provisions should therefore be made either in the existing Municipal Act which is under revision or by fresh legislation and the introduction of model building regulations which will enable Municipal Councils to carry out schemes for the relief of congestion and town planning on sound sanitary principles. In other respects most Municipalities have shown considerable enterprise in availing themselves of the aid offered by the sanitation grant and submitted proposals for the improvement of sanitation which, on the whole, were well considered and reasonable. But 21 Municipalities however, either owing to apathy and want of enterprise or through a desire to be left alone, failed to secure a fair share of the distribution since the institution of the grant and they have formed the subject of special investigation and report.

76. The following table gives the information required in G.O. No. 643 M., Mis., dated the 25th March 1914.

Statement showing expenditure incurred in 1913-14 from 45. Civil Works—Provincial funds from April 1913 to March 1914 on several water-supply and drainage works :—

Name of work.	Expenditure to end of March 1914, inclusive of anticipated supply accounts.
1. Extending the Vizagapatam water-supply at Waltair.	7,400
2. Acquiring the land near the water-supply reservoir at Vizagapatam	15,359
3. Improvements to the Guntur water-works ...	88
4. Water-supply schemes to the town of Masulipatam ...	1,000
5. Water-supply scheme at Ellore	48,802
6. Constructing a drain from the head sluice of Patha Cuddapah tank supply channel to an outlet in Nekkolagundi drain	7,349
7. Extending the Ootacamund drainage works to Kandai bazaar and other places	1,520
8. Connecting the new revenue clerks' quarters on Jail Hill which are now in actual occupation with Ootacamund drainage system	3,694
9. Improvements to the lake stream at Ootacamund ...	2,663
10. Water-supply scheme at Uhingleput	1,071
11. Constructing reinforced concrete service reservoirs for Nellore water-works	5,151
12. Extending the pipe lines of the Nellore water-works ...	19,106
13. Kodaikanal water-supply scheme	16,452
14. Improvements to the water-supply scheme at Dindigul.	1,712
15. Relaying the filter beds of water-works, Vellore Fort.	10,124
16. Vellore drainage scheme	5,278
17. Chidambaram water-supply scheme	22,350
18. Madura drainage scheme	2,08,993
19. Preliminary investigation of the Rāmnād water-supply scheme	4,509
20. Deep sealed boring for the Cochin water-supply ...	21,550
21. Purchase of an engine and a boiler in connection with the Tanjore water-works	5,221
22. Investigation of the Varattur scheme for Palni water-supply	36
23. Constructing experimental sand and mechanical filters at the King Institute, Guindy	4,621
24. Improvements to the water-supply at Cuddapah ...	1,891
25. Improvements to the Kurnool water-works ...	16,267
26. Rajahmundry water-supply investigation experimental well in Kovur side of the Gādāvari river ...	4,269
27. Investigation of water-supply scheme at Hindupur ...	28
28. Investigation of water-supply scheme at Bellary ...	20
29. Borings in Leper Asylum site at Chingleput ...	1,339
30. Investigation of Tiruvannāmalai water-supply ...	760
31. Converting the existing well into a sanitary well for fixing semi-rotary pumps ...	286
32. Improvements to rural water-supply in the Anantapur district	7,440
33. Water-supply scheme to the town of Berhampur ...	2,000

DISTRICT BOARDS.

77. The number of District Boards administered under the Local Boards Act, V of 1884, remained the same as in the previous year.

78. The condition of rural sanitation showed some improvement when compared with the previous year as evidenced not only by the greater number of villages conserved but also by the larger budget allotments made for sanitation and the better use made of those allotments. It is hoped this progress will be maintained in coming years. The total number of villages conserved rose from 515 to 555 or an increase of 40 villages where conservancy establishments were employed for the first time. This increase occurs wholly in non-union villages,

the number of conserved unions remaining the same as in the previous year, viz., 389. The improvement of rural water-supplies also received increased attention during the year. It has been decided that every village possessing a population of 500 or over should be provided with a protected well or more as circumstances required. In pursuance of these orders and encouraged by the liberal aid offered by Government from the sanitation grant and the distribution of the five lakhs referred to in paragraph 69 of the report for 1912, several District Boards have selected sites and submitted proposals for providing type-design protected wells and for improving village tanks in the manner laid down by the Sanitary Board. One of the Assistant Sanitary Engineers has also been deputed to visit the Dharmavaram, Kalyandrug and other taluks in the Anantapur district where cholera and guinea-worm prevail, to draw up proposals for constructing wells and improving existing sources of drinking-water supplies. It will thus be seen that the outstanding defect in rural sanitation and the cause of much disease and mortality which was for a long period neglected by local boards on the score of paucity of funds is now being remedied. As regards drainage, however, no material improvement has taken place and matters are in very much the same condition as in last year.

79. The Local Boards Act does not afford sufficient scope, nor are there adequate funds nor the necessary machinery, to undertake effective sanitary measures in rural areas. Nevertheless the future is hopeful. There is an evident desire among the people for better and improved sanitary conditions. This has manifested itself in various ways, as for instance, in the formation of sanitary associations and the levying and administration of fees obtained as purely private contributions for conservancy purposes and improving water-supplies, and the setting aside of sites away from the villages for latrine purposes and for the storage of manure so as to prevent fouling of the surroundings of the village by indiscriminate defecation and the nuisance and danger arising from the prevalence of flies. These voluntary efforts are worthy of encouragement and they should be fostered and aided.* Efforts are also being made to educate the people and to create a sanitary conscience by means of lectures and lantern slide exhibitions illustrating the importance of sanitation, how it is abused and the evils of such abuse.

80. The control of epidemics has also received attention not only by the prompt measures adopted to check outbreaks of cholera but also by the formation of an epidemic reserve in charge of two Assistant Surgeons which, it is hoped, is the first step towards the creation of a more complete rural sanitary organisation.

81. The major works proposed in rural areas are detailed in the report of the Sanitary Engineer to Government. The minor works carried out by the District Boards consisted as usual of the construction and repair of wells, tanks, drains, latrines, markets and slaughter-houses and improvement of village sites.

82. The allotment for sanitation, which was inadequate, amounted to 9.2 per cent. of the income against 8.2 per cent. in 1912 and the expenditure during the nine-months to 51 per cent. against 45.2 per cent. The largest assignment was made by the District Board of Anantapur followed by the Nilgiris and Chittoor. The best use of the funds allotted was made by the District Boards of Rāmnād, Tanjore, Kurnool, South Arcot, Ganjam, South Canara, Vizagapatam, Malabar, North Arcot, Chingleput and Madura which spent more than 50 per cent. of the allotment. In the remaining districts the expenditure was below this proportion, the District Boards of Kistna and Chittoor being the worst with 37.3 and 38.7 per cent., respectively.

Maintenance of village Sanitary Inspection Books.

83. Village sanitary inspection books were maintained in most unions except in the Nilgiri District.

Mecca pilgrimage.

84.

Nil.

* Note.—Since the above was written, G.O No. 1088 L., dated 13th June 1914, has been received in which Government have requested Presidents of District Boards to report on what principles examples of voluntary effort in the cause of sanitation might be encouraged.

SECTION X.

GENERAL REMARKS AND PERSONAL PROCEEDINGS.

85. I held the appointment of Sanitary Commissioner from the commencement of the year up to the 25th July when I proceeded on three months' privilege leave, my Deputy Captain M. J. Quirke, I.M.S., acting for me during my absence. During the period I was in charge, I proceeded in the early part of January to Tinnevelly and Palamcottah for the inspection of sanitary schemes and to Tuticorin where, in addition to sanitary schemes, the question of a site for a general cemetery engaged my attention. Thence I journeyed to Madura where I examined the sanitary works the municipality had under consideration and made a joint inspection with the Surgeon-General and the Sanitary Engineer of the municipal markets as a result of which the Sanitary Engineer has recently submitted revised type-designs for markets better suited to Indian conditions. Opportunity was at the same time taken to inspect the new water-supply proposals drawn up by the Sanitary Engineer. From the 24th to 30th January I camped at Tiruppattur and Erode; in the former town for the inspection of sanitary schemes and in the latter to inspect the proposals for a piped water-supply, the extension of municipal limits and sanitary schemes. In February I visited Srirangam to examine certain sanitary works proposed by the Municipal Council and the defective state of registration of births and deaths. In March I proceeded to Narasaraopet to inspect in company with the Sanitary Engineer the water-supply scheme and thence to Guntur where I examined the proposals for improving the water-supply of the town and discussed the question of the site for a general hospital. The question of the Marlimund reservoir took me to Ootacamund towards the end of April. Thence I returned to Madras and proceeded immediately to Calicut in connection with the sanitary schemes proposed by that municipality. On completion of my duty at Calicut I availed myself of the privilege accorded in G.O. No. 343 L., dated 20th March 1907, and remained at Ootacamund from the 8th May to 7th June. My presence being required in Madras in connection with certain matters affecting the King Institute and the selection of sites for certain public buildings, I returned to Madras on the 8th June. Thence I proceeded to Salem where the question of removing a certain village from the catchment of the Panamārathupatti tank was awaiting my inspection for some time. Inspection showed that the removal of the village was unnecessary and I advised the Chairman accordingly. At the same time I examined the proposals for opening up the fifth division of the municipality and approved of certain extension sites. The Central Jail was also visited. From Salem I proceeded to Ootacamund and Coimbatore, the former with reference to Ootacamund drainage and septic tank and the latter for the inspection of certain sites and schemes on which the Chairman desired my opinion. I then returned to Ootacamund as my presence was required by Government at the Conference which had been arranged for considering the anti-malarial measures to be adopted in Cuddapah. This however unavoidably fell through and I finally returned to Madras on the 20th July.

86. During the period Captain Quirke held charge of the office of Sanitary Commissioner he proceeded to Erode for the inspection of sanitary schemes and extension sites and to Tellicherry with reference to the incinerator at Kunhamparamba and certain burial-ground sites which the Council proposed to acquire. Thence he proceeded to Cannanore where questions connected with the drainage of Burnacherry and Camp Bazaar, the selection of sites for nightsoil trenching ground concerning which there was a difference of opinion between the Council and the Civil Surgeon, the improvement of water-supply and other matters for

which the Council intended applying for a grant awaited inspection. Before completing his work at Cannanore he was ordered by Government to proceed to Anantapur for the investigation of a cholera epidemic in the district. He returned to Madras on the 8th August and left the same day for Anantapur where he was engaged on this epidemic work from the 9th to 19th August and inspected the towns and villages detailed in his report embodied in G.O. No. 1862 L., dated 13th October 1913, when he was summoned to Ootacamund to attend the postponed Conference referred to above. On completion of duty at Ootacamund he returned to head-quarters and proceeded on the 15th September to Cannanore to resume his inspection there. From Cannanore a visit was paid to Mangalore where sanitary schemes proposed by the Municipal Council required his presence. On his return from the West Coast he found it necessary to proceed to Ootacamund on the 22nd September returning to head-quarters on the 1st October. He then inspected Vellore and Chittoor in October, the former with reference to a memorial protesting against the site of the sewage farm proposed in the drainage scheme and for the inspection of sanitary schemes and the latter to examine the proposals for a piped water-supply scheme drawn up by the Sanitary Engineer. He visited Adoni on the 20th October for the inspection of sanitary schemes and thereafter availed himself of casual leave.

87. I resumed charge on the 25th October and between this date and the close of the year visited Nellore (sanitary schemes), Hindupur (water-supply), and Rajahmundry where besides inspecting certain sanitary schemes I inspected the proposed head water works, the sites for a new hospital and the Central Jail.

88. Whilst at head-quarters I inspected from time to time various sites for public buildings in Madras city and the site proposed for a sewage farm for the Saidapet drainage scheme. The King Institute at Guindy received my constant attention.

89. Orders were received during the year under report appointing Deputy Sanitary Commissioners under the new scheme (G.O. No. 1416, Public, dated 17th November 1913). Captain M. J. Quirke, I.M.S., was appointed to the Central Range, Dr. K. T. Matthew, D.P.H., D.H.Y., to the Northern Range and I was placed in charge of the Southern Range in addition to my duties as Sanitary Commissioner. Since the close of the year, I was relieved of these additional duties, Captain Quirke taking them up in addition to his own. Early steps should be taken to appoint a separate officer for the Southern Range and thus bring the scheme to its full operation.

90. Proposals were made during the year for the abolition of the plague passport system and the introduction instead of the notification system; but final orders were passed only in the current year.

91. Much good work was done by Major T. S. Ross, I.M.S., and Captain J. H. Horne, I.M.S., the two special malaria officers, the details of which will be found under "malaria."

92. The training of second-class Health Officers, proposals for educating the people in the importance of sanitation and the prevention of malaria by means of model lessons and lantern slide exhibitions and the formation of an epidemic reserve also engaged my attention. The cholera reserve consisting of two parties of 10 Sanitary Inspectors each in charge of an Assistant Surgeon has since been formed and the result of the experiment will be watched with interest.

93. The scheme for the employment of first and second class Health Officers in the towns specified in paragraph 59 of the report for 1912 was not given effect to owing to certain details not having been settled before the close of the year. The "trial scheme" of vaccination still continues to be in force in the four districts of Madura, South Arcot, North Arcot and Chingleput. The proposals for its extension to other districts which was under consideration for some time have since been negatived by Government. The improvement of the vaccination staffs in the Presidency which depended upon the general extension of the trial scheme and which calls for speedy reform has however been recognized and steps will shortly be taken to put the matter on a more satisfactory footing.

94. Twenty-five Assistant Surgeons qualified as Sanitary Assistants to District Medical and Sanitary Officers and 9 Sanitary Inspectors employed by local bodies took post-graduate course and passed the examination prescribed in G.O. No. 660 L., dated 21st May 1910. Thirty-three Assistant Sanitary Inspectors qualified from the Medical College and 24 passed the examination in Minor Sanitary Engineering. Thus there are now on the rolls 668 Sanitary Inspectors and 194 Assistant Sanitary Inspectors, of whom 406 are employed on sanitation and vaccination work, the rest being employed in various other capacities. Twenty-eight men qualified as vaccinators from the King Institute of Preventive Medicine, Guindy.

95. The checking of stores and the maintenance of the service registers of my office establishment have been duly maintained. I would repeat my remarks in paragraph 82 of my last year's report regarding the increase of work falling upon my office establishment which is below requirements and should be increased.

W. A. JUSTICE, Major, I.M.S.,

OFFICE OF SANITARY COMMISSIONER,
MADRAS,

Sanitary Commissioner for Madras.

APPENDIX.

APPENDIX.

VITAL STATISTICS OF THE GENERAL POPULATION.

No. I.—Statement showing the Births registered in the districts of the Madras Presidency during the year 1913.

1 Number Males.	2 Population (exclusive of Europeans and Eurasians) as per census of 1911.	3 Districts.	Population (exclusive of Europeans and Eurasians) for which returns were received.			Number of births regis- tered (exclusive of Europeans and Eurasians and still-births).			Ratio of births per 1,000 of population.			6 Males.			7 Males.			8 Males.			9 Males.			10 Males.			
			Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	
1	498,945	468,738	962,683	Anantapur	...	493,945	468,738	962,683	16,072	15,776	31,848	167	164	331	1019	1019	210	161	155	316	155	155	312	153	312		
2	496,637	485,007	981,644	Bellary	...	495,637	485,007	981,644	17,080	16,476	33,556	174	168	342	1052	1052	210	159	153	312	152	152	312	152	312		
3	704,127	690,083	1,403,210	Chingleput	...	704,127	690,083	1,403,210	27,730	26,308	54,096	198	188	386	1052	1052	210	190	182	372	182	182	372	182	372		
4	628,222	609,222	1,238,454	Chittoor	...	629,232	609,222	1,238,454	19,053	18,364	37,417	154	148	302	1088	1088	210	143	140	283	140	140	283	140	283		
5	1,045,818	1,071,505	2,117,318	Coimbatore	...	1,013,818	1,071,505	2,117,318	33,201	32,156	65,315	157	157	302	1081	1081	210	164	157	321	157	157	321	157	321		
6	454,027	439,915	893,942	Cuddapah	...	454,027	439,915	893,942	12,761	12,882	25,143	148	138	301	1082	1082	210	126	126	249	126	126	249	126	249		
7	868,822	1,001,819	1,870,641	Ganjam Plains	...	868,822	1,001,819	1,870,641	29,291	27,611	56,902	156	148	304	1061	1061	210	133	133	210	133	133	210	133	210		
	175,779	174,681	350,460	Do. Agency	...	4,373	4,466	8,838	151	140	291	171	168	329	1078	1078	210	133	133	210	133	133	210	133	210		
	1,044,361	1,176,500	2,221,101	Total	...	873,195	1,006,261	1,879,479	29,442	27,751	57,193	157	147	304	1061	1061	210	130	130	210	130	130	210	130	210		
	707,287	737,886	1,445,133	Golavari Plains	...	707,297	737,886	1,445,133	22,863	21,694	44,557	158	150	308	1054	1054	210	136	136	210	136	136	210	136	210		
	104,489	102,899	206,886	Do. Agency	...	104,489	102,899	206,886	2,354	2,534	4,888	122	114	236	1076	1076	210	133	133	210	133	133	210	133	210		
	811,786	840,235	1,652,021	Total	..	811,786	840,235	1,652,021	25,397	24,048	49,445	154	145	299	1056	1056	210	130	130	210	130	130	210	130	210		
9	855,548	840,782	1,697,330	Guntur	...	855,548	840,782	1,697,330	33,816	31,838	65,654	199	188	387	1062	1062	210	131	131	210	131	131	210	131	210		
10	994,802	1,002,452	1,997,254	Kistna.	...	994,802	1,002,452	1,997,254	38,137	36,546	74,683	191	188	374	1044	1044	210	132	132	210	132	132	210	132	210		
11	491,154	483,305	974,459	Kurnool	...	491,154	483,305	974,459	9,379	7,757	9,351,116	15,304	15,035	30,339	103	103	210	132	132	210	132	132	210	132	210		
12	289,032	245,136	504,138	Madras	...	289,032	245,136	504,138	504,136	504,136	9,678	9,276	18,954	192	184	376	1043	1043	210	132	132	210	132	132	210	132	210
13	945,872	986,184	1,932,006	Madura.	...	945,872	986,184	1,932,006	986,34	1,932,006	27,541	26,808	53,844	143	136	279	1047	1047	210	132	132	210	132	132	210	132	210
14	1,422,585	1,582,931	3,015,499	Malabar.	...	1,422,585	1,582,931	3,015,499	1,527,771	3,004,899	52,479	49,986	102,475	166	166	341	1050	1050	210	132	132	210	132	132	210	132	210
15	686,011	662,581	1,327,592	Nellore	...	686,011	662,581	1,327,592	20,284	19,626	39,810	163	147	304	1089	1089	210	132	132	210	132	132	210	132	210		
16	53,036	60,956	113,992	Nilgiris	The	60,956	53,036	60,956	60,956	60,956	1,654	1,654	3,151	145	145	311	132	132	210	132	132	210	132	132	210	132	210
17	969,545	990,387	1,959,932	North Arcot	...	969,545	990,387	1,959,932	1,959,387	1,959,387	34,341	32,845	67,186	175	168	343	1043	1043	210	132	132	210	132	132	210	132	210
18	786,127	872,225	1,655,352	Ramnad	...	786,127	872,225	1,655,352	872,225	872,225	21,931	20,162	42,093	132	122	254	1088	1088	210	132	132	210	132	132	210	132	210
19	876,659	889,437	1,766,096	Salem.	...	876,659	889,437	1,766,096	889,437	889,437	29,477	28,997	59,784	172	167	339	1028	1028	210	132	132	210	132	132	210	132	210
20	1,172,341	1,189,400	2,361,741	South Arcot	...	1,172,341	1,189,400	2,361,741	2,361,741	2,361,741	35,804	34,372	70,176	152	145	297	1042	1042	210	132	132	210	132	132	210	132	210
21	577,832	616,886	1,194,728	South Canara	...	577,832	616,886	1,194,728	1,194,728	1,194,728	21,376	20,470	41,836	174	174	350	1044	1044	210	132	132	210	132	132	210	132	210
22	1,122,383	1,239,189	2,361,582	Tambrapuri	...	1,122,383	1,239,189	2,361,582	1,239,189	1,239,189	34,741	32,582	66,514	147	147	302	1051	1051	210	132	132	210	132	132	210	132	210
23	865,408	924,819	1,790,222	Tinnevelly	...	865,408	924,819	1,790,222	1,790,222	1,790,222	32,580	31,485	64,065	176	176	353	1038	1038	210	132	132	210	132	132	210	132	210
24	1,218,823	1,298,869	2,517,694	Trichinopoly	...	1,218,823	1,298,869	2,517,694	1,082,275	1,082,275	2,105,839	154	146	304	1049	1049	210	132	132	210	132	132	210	132	210		
25	1,118,323	1,118,342	2,163,166	Vizagapatam Plains	...	1,118,323	1,118,342	2,163,166	1,118,342	1,118,342	33,436	32,368	65,804	154	154	304	1033	1033	210	132	132	210	132	132	210	132	210
26	20,534,206	21,245,026	41,829,232	Vizagapatam Agency	...	19,677,839	20,325,876	40,005,735	658,416	630,202	1,238,618	165	167	322	1045	1045	210	132	132	210	132	132	210	132	210		
269	2,388,240	2,448,155	4,831,395	Total of Town circles in the Presidency.	...	2,388,240	2,448,155	4,831,395	75,303	75,303	155,332	166	166	322	1068	1068	210	132	132	210	132	132	210	132	210		
231	18,200,966	18,796,871	36,997,837	Total of Rural circles in the Presidency.	...	17,206,619	17,877,721	35,174,340	578,387	564,899	1,133,286	164	158	322	1045	1045	210	132	132	210	132	132	210	132	210		

Excess of
deaths per
1,000 of
population.

Excess of
deaths per
1,000 of
population.

Excess of
deaths per
1,000 of
population.

Mean ratio of
births per
1,000 of
population.

VITAL STATISTICS OF THE GENERAL POPULATION.

23

No. 11.—Statement of Births and Deaths registered in the districts of the Madras Presidency during the year 1918.

Number.	Districts.	Population (exclusive of Europeans and Eurasians) for which returns were received.						Number of deaths registered (exclusive of Europeans and Eurasians and born-dead).						Ratio of deaths per 1,000 of population from						Mean ratio of deaths per 1,000 during previous five years.		
		2	3	4	5	6	7	8	9	10	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	
1	Amantanipur	6,718	143.3	493,945	468,738	9,62,683	31,848	33.1	12,577	11,985	24,512	105.4	4.7	0.4	0.1	0.8	2.0	0.4	14.4	25.5	25.5	27.3
2	Bellary	6,875	167.1	495,687	485,007	9,81,644	33,556	34.2	12,070	11,038	23,103	103.4	1.0	0.7	0.6	2.4	1.5	1.2	0.3	15.8	21.3	20.3
3	Chingleput	8,077	127.7	646,818	639,083	1,403,270	54,098	38.6	16,972	16,373	33,300	103.4	0.2	0.3	0.1	3.0	2.5	2.7	0.3	23.5	30.3	26.2
4	Chittoor	6,676	218.2	629,282	609,222	1,238,454	37,417	30.2	12,782	12,375	25,157	108.3	1.4	0.6	0.4	1.4	0.4	1.4	0.3	23.4	27.5	24.2
5	Coinbatore	7,196	294.0	1,048,813	1,071,505	2,115,318	65,357	30.9	21,870	21,507	43,467	101.3	0.9	1.0	1.0	2.7	2.4	1.4	0.3	20.3	20.0	20.0
6	Cuddapah	6,892	151.7	454,027	438,915	893,942	25.1	28.1	8,134	7,892	16,026	108.1	1.2	0.3	0.1	0.8	1.5	0.4	5.6	17.9	17.9	26.7
7	Ganjam, Plains Do. Agency.	4,896	382.1	863,822	1,001,819	1,870,641	56,902	30.4	16,558	15,847	32,405	104.5	0.3	0.3	0.001	12.8	1.1	0.3	2.3	19.1	15.6	27.2
	Total ...	5,095	368.9	873,195	1,006,284	1,879,479	52.9	100	117	117	32,622	104.3	0.3	0.3	0.001	21.8	1.0	0.3	2.3	19.1	15.9	21.0
8	Godavari, Plains Do. Agency.	2,545	667.8	707,287	737,886	1,445,153	44,557	30.8	12,744	12,171	24,915	104.7	0.5	0.1	0.1	6.3	0.5	0.8	0.2	7.3	18.0	17.2
	Total ...	6,221	265.6	840,235	811,786	1,652,021	49,445	29.9	14,331	14,331	27,897	105.9	0.4	0.1	0.1	8.4	0.5	0.8	0.2	8.8	17.7	16.1
9	Guntur	6,735	298.0	856,548	840,782	1,697,330	65,654	38.7	19,350	17,779	37,129	107.8	0.4	0.3	0.001	10.6	0.8	1.0	0.1	8.1	22.6	21.1
10	Kistna	5,907	338.1	994,802	1,002,452	1,997,254	74,633	37.4	20,786	19,424	40,210	107.0	0.0	0.3	0.3	8.4	0.5	1.3	0.2	9.9	19.4	20.1
11	Kurnool	7,580	123.4	471,379	463,787	935,116	30,359	32.4	8,104	8,510	17,614	107.0	0.5	0.3	0.3	11.6	0.5	0.7	0.2	5.0	19.3	18.3
12	Madras	27	181.8	259,002	246,136	504,138	37.6	30.9	10,295	10,027	20,532	102.7	0.1	0.1	0.001	5.5	10.2	10.2	0.3	16.8	39.7	40.3
13	Madura	4,916	893.0	945,872	986,184	1,932,006	63,844	37.9	18,616	18,381	37,947	107.0	1.6	0.4	0.004	4.2	1.0	1.0	0.3	10.9	20.7	19.3
14	Malabar	5,795	518.5	1,627,771	1,652,775	3,004,899	102,575	84.1	41,019	38,657	79,676	106.1	1.4	0.1	0.005	8.5	9.9	13	0.4	27.8	26.5	28.6
15	Nellore	665,011	662,581	1,272,771	1,262,592	39,810	30.9	12,707	11,808	24,545	107.9	0.7	0.5	0.001	8.8	1.6	1.6	0.3	6.4	19.2	17.8	
16	Nellore, The	1,009	118.0	60,956	68,085	1,113,991	3,618	30.9	1,607	1,382	2,969	116.3	0.1	0.3	0.4	8.0	0.1	0.5	0.1	9.5	26.4	27.3
17	North Arcot	4,920	843.1	67,952	66,546	84,937	1,959,932	67,186	84.3	20,835	19,944	0.1	0.0	0.0	0.3	12.6	2.1	2.1	0.2	12.6	21.5	24.1
18	Ramnud	4,834	343.1	876,127	872,225	1,658,352	62,038	25.4	14,578	14,418	28,996	101.1	1.0	0.3	0.3	6.0	1.2	0.7	0.2	8.1	18.6	17.9
19	Salem	6,300	280.3	876,659	889,437	1,766,096	59,784	33.9	18,515	18,126	36,644	102.4	0.8	0.5	0.1	5.4	1.1	0.7	0.3	11.8	20.4	23.3
20	South Arcot	4,021	1,711.3	1,172,841	1,189,400	2,101,741	70,176	28.7	21,896	20,516	49,912	103.6	1.2	0.6	0.3	5.0	1.4	0.8	0.2	20.6	21.1	19.2
21	South Canara	3,727	677,832	616,896	1,194,728	41,880	35.0	13,054	13,640	27,594	102.8	0.3	0.2	0.3	7.6	2.9	0.9	0.4	10.5	24.2	23.1	
22	Tanjore	633.6	1,122,898	1,259,189	2,361,582	7,212,855	30.2	80,649	81,102	61,731	98.6	2.5	0.3	0.02	8.5	1.4	0.5	0.2	17.7	27.3	26.4	
23	Tirunelveli	4,255.3	411.3	865,408	924,819	1,719,022	61,045	32.4	21,920	21,405	42,794	99.9	1.2	0.1	0.1	4.6	1.2	0.6	0.2	10.0	24.7	28.1
24	Tiruchirapally	4,035.7	426.7	1,022,275	1,083,604	2,105,839	63,085	30.0	21,554	21,245	42,839	101.0	0.7	0.4	0.001	4.8	1.0	0.5	0.3	12.6	21.1	22.3
25	Vizagapatam Plains.	4,006	471.3	1,049,824	1,118,842	2,168,166	66,804	30.4	18,215	18,007	37,622	108.3	0.1	0.0005	0.4	0.2	1.3	0.1	18.3	16.6	24.3	
	Grand Total for the Presidency.	126,585	316.0	19,672,859	20,325,876	40,005,735	1,288,618	82.2	436,891	420,660	856,651	108.6	0.9	0.4	0.1	6.7	1.6	1.0	0.3	10.4	22.2	24.0
	Total of Town circles in the Presidency.	...	...	2,448,155	4,831,395	155,832	32.2	64,988	62,011	126,409	103.8	0.9	0.3	0.6	4.6	3.6	1.8	0.3	14.1	27.0	28.9	
	Total of Rural circles in the Presidency.	...	...	2,383,240	4,133,286	1,133,340	32.2	371,698	358,649	730,242	103.6	0.9	0.4	0.1	7.0	1.4	0.8	0.3	9.9	21.5	20.1	
		...	...	17,298,619	17,877,721	35,174,340	1,133,286	32.2	371,698	358,649	730,242	103.6	0.9	0.4	0.1	7.0	1.4	0.8	0.3	9.9	21.5	20.1

Note.—Born-dead cases are not included in this or any of the other statements.

No. III.—Deaths registered in the districts of the Madras Presidency during each month of the year 1913.

1 Number.	2 Districts.	3 January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	4 Total deaths registered during the year.
														Aug. Sept. Oct. Nov. Dec. Jan.
1 Anantapur	...	2,013	1,449	1,489	1,692	1,681	2,515	3,519	2,502	1,870	1,875	1,911	24,512	28,108
2 Bellary	1,684	1,369	1,450	1,045	1,476	1,696	2,534	2,222	2,018	2,161	2,372	33,300
3 Chingleput	3,365	2,304	2,279	2,392	2,622	2,451	2,956	2,041	2,731	3,403	25,157
4 Chittoor	2,926	1,890	1,657	1,543	1,656	2,299	2,085	2,054	2,181	2,261	48,467
5 Coimbatore	5,366	3,953	3,448	2,964	2,816	3,064	3,532	3,386	3,087	3,489	4,370
6 Cuddapah	1,751	1,813	911	1,362	1,147	1,152	1,477	1,646	1,190	1,831	16,026
7 Gannan Plains Do. Agency	2,277	1,689	2,346	2,757	2,95	2,678	3,187	28,405
8 Godavari Plains Do. Agency	2,729	1,705	1,486	1,796	1,863	2,070	2,822	217
9 Guntur	2,793	2,718	2,847	2,793	2,685	2,685	2,838	32,622
10 Kurnool	2,286	1,701	2,286	2,718	2,847	2,836	2,838	27,897
11 Madras
12 Madura
13 Malabar
14 Nellore
15 Nilgiris, The
16 North Arcot
17 Ramanad
18 Salem
19 South Arcot
20 South Canara
21 Tanjore
22 Tirunelveli
23 Trichinopoly
24 Vizagapatam Plains
25 Vizagapatam Plains
Total, Madras Presidency	...	95,916	65,864	61,402	58,830	59,708	64,204	78,051	73,986	66,889	70,615	76,284	89,902	856,651
Ratio of deaths per 1,000 in each month	...	2.4	1.5	1.6	1.5	1.5	1.6	1.8	1.9	1.8	1.8	1.9	2.2	2.14

Number	Districts.	Under 1 year.												60 and upwards.															
		1 to 4.				5 to 9.				10 to 14.				15 to 19.				20 to 29.				30 to 39.				40 to 49.			
		Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.		
1	Amritapur	...	...	2,897	2,712	1,075	1,110	645	627	459	436	504	604	1,104	1,040	1,450	1,007	1,074	981	1,027	2,226	1,868	...	...	...	...
2	Bellary	...	...	3,096	2,545	1,641	1,350	744	658	582	521	401	460	1,631	1,212	920	940	1,012	705	1,012	1,860	1,804	...	...	...	...
3	Chingleput	...	...	6,180	6,404	2,554	2,499	603	596	350	335	819	820	952	1,200	904	889	877	785	1,130	854	2,954	2,958	...	...	...	...
4	Chittoor	...	...	3,123	2,730	1,448	1,380	481	510	397	361	321	664	829	1,237	1,001	1,237	984	1,402	1,123	2,551	2,495	...	...	...	...
5	Cochinatore	...	...	6,347	6,637	2,618	2,702	1,170	1,158	939	877	942	1,127	610	910	2,110	1,683	1,688	1,372	1,904	1,303	3,889	3,625	...	...	...	...
6	Onddappah	...	...	1,707	1,526	594	632	388	353	250	255	281	337	638	930	730	802	690	720	1,087	811	1,606	1,516	...	...	...	...
7	Gaujan Plains	...	...	6,024	4,858	2,188	2,112	811	793	540	450	497	603	1,101	1,238	1,176	1,019	1,313	1,040	1,579	1,613	2,238	2,731	...	...	...	...
7	Ganjam Agency	...	25	30	14	21	4	5	8	12	7	7	12	7	12	7	7	12	7	16	6	9	6	11	
7	Total	...	5,049	4,398	2,202	2,133	845	808	551	447	304	310	1,113	1,215	1,192	1,026	1,315	1,049	1,585	1,622	2,239	2,742	...	...	...	...
8	Godavari Plains	...	3,777	3,200	1,687	1,635	579	495	448	344	409	562	898	1,134	851	760	874	683	985	774	1,261	2,654	...	...	...	...
8	Godavari Agency	...	397	361	220	202	113	104	73	68	68	73	98	110	180	99	137	80	131	93	213	186	...	...	...	...
8	Total	...	4,174	3,561	1,907	1,887	662	580	521	402	475	615	981	1,243	890	889	1,001	763	1,096	867	2,474	2,740	...	...	...	...
9	Guntur	...	...	6,964	6,760	3,246	3,102	800	818	426	445	485	759	971	1,425	962	920	1,001	687	1,120	865	3,296	3,688	...	...	...	...
9	Kistna	...	...	7,897	6,516	2,707	2,464	851	819	527	495	523	568	1,168	1,076	1,071	1,087	1,158	896	1,254	959	3,570	3,682	...	...	...	...
10	Kurnool	...	...	2,451	2,070	1,283	1,204	457	449	254	227	255	333	634	843	696	694	812	594	914	726	1,606	1,469	...	...	...	...
11	Madras	...	...	2,975	2,671	1,100	1,647	474	413	248	283	250	297	777	864	716	624	782	610	730	655	1,743	1,943	...	...	...	...
12	Madura	...	...	5,170	4,288	2,984	2,914	802	897	642	644	618	648	1,457	1,681	1,444	1,317	1,636	1,101	1,530	3,312	3,655	...	...	...	...
13	Malabar	...	...	9,258	7,935	7,160	7,240	2,032	2,637	1,151	1,167	1,246	3,282	5,867	5,900	5,662	5,539	2,160	3,982	5,472	6,405	2,748	2,663	...	...	...	...
14	Nellore	...	...	2,146	2,460	1,383	1,385	75	687	551	554	586	650	940	1,028	767	843	630	984	832	853	2,748	2,663	...	...	...	...
15	Nilkritis, Then...	...	360	300	946	934	69	52	67	52	52	67	39	37	4	144	169	148	137	83	103	174	142	...	...	...	...
16	North Arcot	...	...	5,891	6,249	3,478	3,617	1,140	1,171	710	710	713	1,033	1,210	1,210	1,970	1,196	1,079	1,381	1,161	1,380	3,880	3,880	...	...	...	...
17	Ramnud	3,906	2,906	2,396	2,396	636	646	464	405	382	603	1,025	1,900	1,081	1,101	1,180	984	1,114	1,300	1,114	2,773	3,070	
18	Salem	...	...	6,207	5,177	2,388	2,390	798	795	515	620	373	715	1,096	1,401	1,162	1,187	1,372	1,081	1,428	1,354	2,951	3,086	...	...	...	...
19	South Arcot	...	...	7,736	6,981	4,273	4,290	1,018	1,276	947	886	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,026	1,448	3,582	3,534	3,534	3,534	3,534
20	South Canara	3,822	3,925	1,558	1,645	568	562	447	447	539	539	1,089	1,495	1,302	1,160	1,383	976	1,288	2,115	2,115	2,563	
21	Tanjore	3,380	3,854	3,325	3,344	802	824	771	771	832	821	2,219	2,577	2,612	2,309	2,319	2,319	2,178	2,568	2,184	7,417	7,417	
22	Tunney	...	...	6,705	6,059	3,642	3,880	985	920	577	501	582	751	1,220	1,571	1,283	1,331	1,422	1,116	1,288	1,288	3,474	3,474	...	...	...	...
23	Trichinopoly	6,550	5,481	3,113	3,028	924	865	557	524	876	1,129	1,709	1,709	1,709	1,709	1,709	1,709	1,709	1,709	1,709	1,410	1,422	4,802	4,802	
24	Virasapattam Plains.	...	6,172	4,513	2,481	1,026	864	648	515	506	671	1,305	1,377	1,377	1,377	1,377	1,377	1,377	1,377	1,377	1,377	1,377	1,377	1,377	1,377	1,377	1,377		
25	Total, Presidency	...	121,616	107,324	61,156	61,113	21,403	20,355	13,414	12,401	18,666	17,360	20,355	20,355	20,355	20,355	20,355	20,355	20,355	20,355	20,355	20,355	20,355	20,355	20,355	20,355	20,355		
	Total population according to the census of 1911	...	567,721	563,072	2,081,198	2,168,605	2,639,605	2,183,300	2,428,211	2,243,765	1,737,439	3,105,703	2,639,946	3,610,872	2,639,946	2,639,946	2,639,946	2,639,946	2,639,946	2,639,946	2,639,946	2,639,946	2,639,946	2,639,946	2,639,946	2,639,946	2,639,946	2,639,946	2,639,946
	* Ratio per milles of population	...	219,6	184,1	215	282	81	76	65	78	103	105	105	117	117	117	117	117	117	117	117	117	117	117	117	117	117	117	117

* Calculated on the total population for Presidency as per censuses of 1911 including Europeans and Eurasians though the statistics are exclusive of Europeans and Eurasians and born-dead cases.

1,204,461

APPENDIX.

No. V.—Deaths registered according to Classes in the districts of the Madras Presidency during the year 1913.

Number X	Districts.	Population for which returns were received.			Number of deaths registered.					Ratio of deaths per 1,000 of population.					
		Indian Christians.	Mahem-madans.	Hindus.	Other classes.	Total	Indian Christians.	Mahem-madans.	Hindus.	Other classes.	Total.	Indian Christians.	Mahem-madans.	Hindus.	Other classes.
1															
2															
3															
4															
5															
6															
7															
8															
9															
10															
11															
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15															
16															
17															
18															
19															
20															
21															
22															
23															
24															
25															
Total, Madras Presidency	...	1,138,869	2,730,235	35,929,643	206,988	40,005,735	21,239	64,841	768,107	2,664	856,651	18,6	23,7	21,4	12,9

No. VI.—Births and Deaths registered from Different Causes in the Districts and towns of the Madras Presidency during the year 1913.

Districts and towns.	Population for which returns were received.	Total number of population.	Births.	Deaths.	Injuries.										Ratio of deaths per 1,000 of population.													
					All other causes.					Total deaths from All causes.					All other causes.					From all causes.								
					Males.	Females.	Wounds and disabilities.	Scoldings.	Deaths.	Males.	Females.	Small-pox.	Cholera.	Plague.	Males.	Females.	Small-pox.	Cholera.	Plague.	Males.	Females.	Small-pox.	Cholera.	Plague.				
<i>A.—Districts.</i>																												
1 Ahanapuri	28,973	342	3,916	359	44	2,338	686	1,688	22	42	143	132	...	539	12,699	28,069	46	0.4	0.05	2.8	0.3	15.0	26.0	27.8		
2 Bellary	28,084	336	930	631	215	1,814	1,010	823	18	52	130	48	...	224	12,985	18,762	11	0.7	0.1	2.2	1.0	15.5	22.4	29.5		
3 Chingleput	47,782	387	138	382	...	3,830	2,756	179	15	17	156	62	...	240	10,973	26,243	02	0.3	...	3.2	2.2	0.8	16.5	23.4		
4 Chittoor	35,813	306	1,615	667	50	7,113	1,618	1,111	12	28	317	18	5	162	10,372	23,061	14	0.6	0.04	6.1	1.1	1.4	0.1	24.0		
5 Cuddalore	2,037	1,280	1,736	311	1,280	4,161	2,711	36	52	360	148	17	...	613	0,550	38,758	09	1.7	0.7	2.8	2.3	1.4	0.3	19.7		
6 Cuddalore	23,656	297	1,670	262	53	6,960	673	1,825	10	37	188	51	...	215	8,480	15,067	14	0.8	0.1	8.8	0.5	1.6	0.1	21.2		
7 Ganjam	Pains	...	31,000	395	510	621	1	23,236	1,767	450	35	53	215	139	...	144	8,413	30,374	03	0.1	0.001	13.1	1.0	0.3	0.2	17.2		
7 Ganjam Agency	8,838	201	3219	...	9	...	113	1	...	...	1	...	...	10	4	217	...	1.0	...	21.8	0.1	...	1.2	...		
Total	54,201	305	510	683	1	23,420	1,768	150	5	55	216	118	...	151	3,417	30,601	03	0.4	0.001	13.1	1.0	0.3	0.2	20.7		
8 Godavari Plains	39,428	314	630	91	...	10,518	324	1,012	18	31	128	93	...	270	8,436	21,624	05	0.1	...	8.8	0.4	0.8	0.2	17.2		
Godavari Agency	20,838	236	4,888	91	...	1,411	86	103	...	2	22	30	...	83	782	2,982	01	0.1	...	0.2	0.4	0.5	0.2	14.1		
Total	59,001	330	4,316	303	...	1,461,483	610	12,876	18	33	150	152	...	553	8,787	24,500	05	0.1	...	0.2	0.4	0.5	0.2	14.1		
9 Guntur	1,254,505	394	3,888	64	312	...	1,412	86	103	...	2	22	30	...	83	782	2,982	01	0.1	...	0.2	0.4	0.5	0.2	14.1	
10 Kistna	1,767,684	67,583	382	90	452	...	16,649	1,33	1,400	19	26	18	33	...	326	13,408	33,011	01	0.2	...	0.2	0.4	0.5	0.2	14.1	
11 Kurnool	896,502	28,463	28,463	281	498	280	...	10,980	278	308	17	18	121	39	1	136	4,214	16,284	06	0.3	...	11.6	0.3	0.6	0.2	24.8
12 Medura	1,669,765	44,625	287	2,112	643	8	6,610	1,898	1,212	13	36	231	110	...	170	16,804	29,857	13	0.4	0.005	4.0	1.1	0.8	0.3	18.5	
13 Malabar	2,770,983	93,482	337	4,135	320	6	21,583	10,234	3,638	52	40	674	215	40	121	28,519	72,464	15	0.1	0.002	8.9	3.7	1.3	0.3	27.0	
14 Nellore	1,223,863	37,005	307	770	640	...	11,128	1,391	160	63	53	198	65	7	376	7,276	22,373	06	0.6	...	9.0	1.6	0.2	0.3	19.1	
15 Nilgiris, The	79,211	2,185	276	7	28	18	571	413	160	...	5	5	600	1,932	01	0.3	0.2	11.0	1.9	0.1	0.2	21.1	
16 North Arcot	1,719,080	59,151	314	1,830	1,211	200	4,160	1,771	93	18	269	131	0	417	21,627	34,918	11	0.7	0.2	2.4	1.0	0.8	0.3	12.9		
17 Ramanad	1,858,141	33,787	1,300	117	...	8,542	1,394	958	16	17	107	7	...	207	10,329	23,117	10	0.3	...	6.3	1.0	0.7	0.1	17.2		
18 Salem	1,052,281	64,827	332	1,307	945	8	9,342	1,046	31	37	306	118	102	18,706	32,555	05	0.6	0.014	5.7	1.0	0.6	0.3	23.5	
19 South Arcot	2,169,945	45,285	307	2,652	1,203	...	11,193	2,435	1,481	13	219	170	...	181	25,143	44,464	12	0.1	...	3.1	1.4	0.8	0.2	24.0		
20 South Canara	1,121,760	30,388	351	970	223	29	8,955	3,277	583	25	27	320	80	7	150	11,615	25,911	03	0.2	0.03	8.0	2.9	0.9	0.4	23.1	
21 Tanjore	1,988,356	30,735	5,234	304	1	6,519	2,662	731	34	45	261	104	6	610	33,773	30,494	26	0.3	0.001	3.3	1.0	0.4	0.3	27.7		
22 Tirunelveli	1,352,349	49,073	367	1,004	88	...	6,654	901	460	13	32	197	25	...	267	22,250	32,924	12	0.1	...	4.9	0.7	0.3	1.4	25.8	
23 Trichinopoly	1,881,506	65,382	295	1,103	857	...	8,922	1,440	982	15	36	232	205	8	846	22,715	36,927	06	0.6	...	4.9	0.9	0.5	0.3	22.2	
24 Vizagapatam Plains	1,986,075	38,604	306	8	104	...	31,283	265	251	12	23	150	60	...	275	1,602	38,753	002	0.1	...	16.0	6.1	0.1	0.1	17.3	
Total, Rural districts	35,174,340	1,133,236	822	33,102	13,562	2,102	249,663	48,175	.651	130	777	5,329	2,386	102	0.1	348,293	730,212	03	0.4	0.01	7.0	1.1	1.8	0.3	25.4	

Norm.—Statistics of mortality from rabies are exhibited in a separate sub-column under "Injuries" of the annual Form No. VI as per G.O. No. VI, dated 7th July 1913.

VI.—Births and Deaths registered from Different Causes in the districts and towns of the Madras Presidency during the year 1918—cont.

No. VI.—Births and Deaths registered from Different Causes in the u. Pots and towns of the Madras Presidency during the year 1913—cont.

Number.	Districts and towns.	Population for which returns were received.	Ratio of deaths per 1,000 of population.											
			1	2	3	4	5	6	7	8	9	10	11	12
44	E.—Towns—cont.													
	Coimbatore—cont.													
45	M.T.C. Brode	16,701	658	394	12	16	...	36	180	42	...	2	2-2	7-8
46	T.C. Kattur	18,801	111	5-9	6	15	7-6	104	1-1	1-1	...	1-0	1-0	2-9
47	T.C. Dharaipuram	444	538	30-0	116	4-4	2-4	20	1-1	2-4	...	0-8	0-9	5-8
48	T.C. Kolachi	12,656	24-1	116	5	24	19	97	15	2-1	...	0-4	0-5	27-1
49	T.C. Udumalpet	10,105	28-6	16	3	28	16	95	1-1	2	...	0-3	0-4	22-9
50	T.C. Gobichettipalayam	10,446	171	16-7	8	22	15	55	1-1	2	...	0-3	0-4	24-8
51	T.C. Tiruppur	10,163	381	37-5	1	6	22	22	1-1	2	...	0-2	0-3	16-7
52	T.C. Bhavani	9,529	184	16-8	1	1	16	42	1-1	1	...	0-1	0-2	16-7
53	T.C. Pallavaram	6,985	379	45-5	...	31	11	7	1	1	...	0-3	0-2	4-7
54	T.C. Anamalai	5,397	172	29-4	...	13	3	22	9	...	...	0-2	0-3	18-5
55	M.T.C. Oddiyapal	17,807	468	26-8	2	1	18	87	35	44	...	6	200	363
56	T.C. Jammalazadugu	16,089	234	14-5	1	1	...	18	3	13	...	...	...	11-2
57	T.C. Prodhatpur	15,750	173	11-0	1	1	...	50	8	1-1	...	...	...	10-3
58	T.C. Rassampetta	15,649	193	8-4	13	2	...	56	1-1	1	...	...	...	14-3
59	T.C. Badravali	11,850	187	16-1	1	1	...	5	10	107	...	0-1	0-2	4-7
60	T.C. Vempalli	10,361	98	9-5	1	1	...	20	39	1	...	...	...	12-8
61	T.C. Rayachott	8,019	214	20-7	...	...	...	17	3	1	...	...	...	17-7
62	T.C. Poramandal	5,484	90	10-0	...	...	...	...	...	0	...	...	...	14-8
63	M.T.C. Chitradole	17,832	631	32-5	2	...	...	100	80	...	1	2	1	5-8
64	M.T.C. Berhampur	31,446	841	28-9	3	6	...	185	62	90	1	5	1	6-2
65	M.T.C. Parlakimedi	18,370	604	33-9	6	...	...	133	42	1	...	3	4	2-3
66	T.C. Ichchhapuram	9,252	200	21-6	17	...	...	47	6	3	...	1	1	7-2
67	T.C. Tekkali	7,838	205	24-7	1	...	...	49	24	10	...	3	3	10-0
68	T.C. Sompetta	7,037	210	28-8	19	...	...	39	14	1	...	6	7	20-1
69	T.C. Russellkonda	6,042	161	29-6	...	...	...	82	4	1	...	...	...	20-8
70	M.T.C. Coecanada	64,110	1,656	30-6	...	1	...	286	114	95	...	16	...	5-3
71	M.T.C. Rajahmundry	48,417	1,684	34-8	1	5	...	268	75	40	2	8	19	0-02
72	T.C. Samalnot	15,483	102	6-6	3	...	...	43	3	...	...	24	0-02	0-1
73	T.C. Peditapuram	15,486	376	24-4	12	...	...	188	1	...	...	21	...	0-7
74	T.C. Pithapuram	15,816	160	10-4	1	...	...	51	2	1	...	9	0-8	0-7
75	T.C. Amalapuram	12,616	311	24-7	...	...	...	48	24	80	1	1	1	3-3
76	T.C. Dowdahiwaram	10,347	321	31-0	6	...	...	11	1	...	...	8	1	0-1
77	T.C. Mandepeta	8,646	325	34-0	...	...	...	42	16	7	2	1	1	1-4
78	T.C. Tuni	9,288	194	20-9	...	...	...	141	6	9	...	...	...	18-2
79	M.T.C. Guntur	40,529	1,616	30-9	...	105	...	251	45	68	1	3	2	0-2
80	M.T.C. Ongole	13,286	499	37-6	...	...	...	78	34	8	1	11	...	5-9
81	M.T.C. Tenali	18,185	594	32-6	...	...	...	163	26	59	2	9	1	0-1
82	T.C. Chitradole	18,618	563	30-2	1	1	...	161	43	48	1	1	1	0-1

APPENDIX.

No. VI.—Births and Deaths registered from Different Causes in the districts and towns of the Madras Presidency during the year 1913—cont.

Number,	Districts and towns.	Population for which returns were received.	Total number.	Ratio of deaths per 1,000 of population.													
				1	2	3	4	5	6	7	8	9	10	11	12	13	14
83	B.—Towns—cont.																
83	T.C. Bapatla	...	16,973	396	39.6	...	...	...	...	...	...	...	...	...	...	...	24.2
84	T.C. Velaiyal-mu	...	1,1,932	376	35.5	...	...	...	...	...	...	...	...	...	...	...	26.1
85	T.C. Mangalabapu	...	1,747	322	36.8	...	...	...	...	...	...	...	...	...	...	...	22.3
86	T.C. Narasaraopet	...	8,743	911	35.6	...	1	2	1	1	1	1	1	1	1	1	24.7
87	T.C. Ponmudi	...	8,340	255	30.2	...	...	...	...	...	...	...	...	...	...	...	18.9
88	T.C. Adanki	...	8,353	303	37.4	1	...	...	...	...	...	...	...	...	...	...	16.5
89	T.C. Allura-Ketapatan	...	8,083	149	24.6	...	...	...	...	...	...	...	...	...	...	...	17.6
90	T.C. Vankonda	...	7,405	380	31.0	1	0	...	...	...	...	...	...	...	...	...	20.6
91	Kistna— M.T.C. Ellore	...	37,819	1,046	32.8	...	46	...	...	...	...	...	...	...	...	...	16.1
92	M.T.C. Masulipatam	...	42,128	1,372	32.6	...	36	...	...	...	...	...	...	...	...	...	25.1
93	M.T.C. Bezawada	...	38,867	1,676	35.6	...	...	...	...	...	...	...	...	...	...	...	20.7
94	T.O. Tannir	...	18,835	415	22.0	...	...	...	...	...	...	...	...	...	...	...	14.8
95	T.O. Attipalillu	...	17,954	228	12.7	...	...	...	...	...	...	...	...	...	...	...	18.8
96	T.O. Palakollu	...	20,658	170	17.0	...	...	...	...	...	...	...	...	...	...	...	20.8
97	T.C. Narasapur	...	11,050	168	15.7	...	...	...	...	...	...	...	...	...	...	...	17.4
98	T.C. Penukonda	...	11,039	281	26.5	...	...	...	...	...	...	...	...	...	...	...	11.0
99	T.O. Nuzivid	...	10,623	304	36.3	...	...	...	...	...	...	...	...	...	...	...	25.0
100	T.O. Gundivada	...	9,180	143	16.6	2	...	...	...	...	...	...	...	...	...	...	19.6
101	T.C. Achanta	...	8,844	227	25.7	...	...	...	...	...	...	...	...	...	...	...	11.1
102	T.C. Appayyapeta	...	8,502	257	28.2	1	...	...	...	...	...	...	...	...	...	...	25.8
103	T.C. Valmiki	...	7,811	342	38.7	...	...	...	...	...	...	...	...	...	...	...	20.8
104	Kurnool— M.T.C. Kurnool	...	26,040	1,171	45.0	14	6	...	...	...	...	...	...	...	...	...	35.2
105	M.T.C. Nandyal	...	16,230	566	34.8	...	1	...	...	...	...	...	...	...	...	...	31.1
106	T.C. Gunnur	...	6,344	140	22.1	...	...	...	...	...	...	...	...	...	...	...	17.2
107	Madras— M.T.C. Madras	...	504,138	18,954	37.6	28	34	3	3,797	5,120	2,700	7	6	155	...	...	40.6
108	Madras— M.T.C. Madura	...	184,120	4,669	34.8	227	92	...	...	906	541	183	2	1	24	2	17.7
109	M.T.C. Periyarvelam	...	18,716	900	45.1	4	...	...	78	181	43	1	1	3	1	1	35.6
110	M.T.C. Dindign	...	35,052	1,287	49.4	9	2	...	...	81	141	...	...	...	...	...	21.5
111	M.T.C. Pahli	...	13,211	655	49.6	251	8	...	...	3	61	...	...	7	...	...	31.7
112	M.T.C. Kodaihakanal	...	2,906	113	36.9	...	...	...	...	13	16	...	...	...	...	...	0.0
113	T.C. Reddyanakun	...	20,188	931	17.0	44	9	...	...	145	2	1	2	...	...	...	26.6
114	T.C. Sholavantam	...	12,419	316	25.4	104	2	...	...	6	6	...	...	...	...	...	31.4

VI.—Births and Deaths registered from different causes in the towns of the Mahratta Presidency during the year 1855.—
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Districts and towns.		Population for which returns were received.		Births.	Deaths.	Injuries.	From all causes.	From all causes.					
				Number.	Rate per 1,000 of population.	Number.	Rate per 1,000 of population.	Number.	Rate per 1,000 of population.	Number.	Rate per 1,000 of population.	Number.	Rate per 1,000 of population.
B.—Towns—cont.													
Madura—coast.	115	9,972	224	225	20	11	5	1	1	139	181	29	192
T.C. Melur	116	8,810	260	254	10	101	5	6	1	73	266	102	74
T.C. Tirumangalam	117	8,702	387	387	2	65	12	4	1	88	132	102	107
T.C. Uthampalayam	118	7,111	263	383	1	62	12	4	1	76	132	117	224
Melabar—	119	M.T.C. Tellicherry	—	1,098	374	6	13	1	1	128	177	148	111
M.T.C. Calicut	120	78,417	3,038	380	21	16	119	73	1	160	281	187	102
M.T.C. Palghat	121	43,319	1,814	409	20	2	8	257	171	3	1,318	1,318	1,318
M.T.C. Cochin	122	20,023	722	361	40	115	10	135	1	124	310	20	103
M.T.C. Cannanore	123	28,987	1,138	383	—	2	1	102	81	1	101	375	647
T.C. Ponmudi	124	13,984	382	273	1	11	11	42	101	5	145	302	302
T.C. Paravur	125	11,140	370	382	—	12	11	18	15	1	160	180	180
T.C. Kannuragram	126	8,408	406	453	5	11	11	74	4	11	118	266	118
Nellore—	127	M.R.C. Nellore	—	33,246	1,082	325	69	61	—	2	1	10	761
T.C. Venkatagarai	128	14,275	362	347	—	97	5	2	—	3	—	3	131
T.C. Kanchipuram	129	10,276	347	353	8	50	9	1	—	1	—	1	83
T.O. Alluru	130	8,832	196	257	6	26	16	7	—	1	88	140	138
T.O. Gudur	131	8,006	204	353	21	41	17	11	—	1	65	139	124
T.C. Kavali	132	6,974	261	374	1	55	14	24	—	8	43	138	138
T.C. Nayudupet	133	6,350	183	353	—	50	11	2	—	1	95	171	171
M.T.O. Ootacamund	134	6,280	167	267	9	64	11	—	1	2	20	132	132
Nagapattinam—	135	M.T.C. Coonoor	—	18,829	764	403	—	14	61	118	21	6	10
M.T.C. Wellington	136	9,453	363	363	1	23	9	46	77	—	1	1	345
North Arcot—	137	T.O. Wellington	—	6,018	206	342	2	13	26	1	1	1	144
M.T.C. Vellore	138	49,746	2,141	480	7	51	61	42	207	91	2	1	1,519
M.T.C. Gudiyattam	139	23,359	503	215	1	130	26	101	20	—	8	1,426	1,426
M.T.C. Walajpet	140	9,462	112	474	—	112	25	36	27	—	1	15	648
M.T.C. Tiruvannamalai	141	21,244	830	381	16	10	84	110	—	1	5	267	849
M.T.C. Tiruppetturai	142	10,470	636	312	15	1	404	34	20	—	4	454	454
M.T.C. Vaniyambadi	143	20,406	731	368	7	9	3	24	47	16	—	3	432
T.O. Ambur	144	13,264	614	337	6	2	2	—	1	1	3	345	1,014
T.C. Arcot	145	11,475	614	307	4	26	—	84	110	—	1	140	253
T.O. Pohur	146	9,229	282	284	—	16	4	1	—	1	1	165	101
T.C. Tirupur	147	9,185	185	202	—	17	1	—	1	1	1	28	118
T.C. Pallonchettai	148	8,008	125	156	13	17	1	—	1	1	1	95	288
T.C. Ranibettai	149	7,917	165	211	12	17	1	—	1	1	1	77	127
T.C. Sholinghur	150	7,675	262	263	1	18	1	—	1	1	1	68	111

No. VI.—*Births and Deaths registered from Different Causes in the districts and towns of the Madras Presidency during the year 1913—cont.*

Districts and towns.		Injuries.										Ratio of deaths per 1,000 of population.											
		Births.					Deaths.					All other centres.					From all causes.						
Number.	Population for which returns were received.	Births.					Deaths.					All other centres.					From all causes.						
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22		
B.—Towns—cont.		Injuries.										Ratio of deaths per 1,000 of population.											
North Arcot—cont.		Injuries.										Ratio of deaths per 1,000 of population.											
T.O. Wandiwash	151	289	343	10	1	2	...	...	...	141	162	1.4	0.2	0.3	0.8	...	20.9	21.8	21.5	16.7	9.7	
T.O. Ariconam	162	6,978	8,596	171	24.5	21.7	11	12	13	187	164	1.6	0.1	1.8	0.1	0.6	1.5	1.5	1.6	23.6	20.1		
T.O. Pernambatru	163	6,118	6,565	156	23.2	23.2	12	1	1	10	159	1.8	0.1	0.7	1.8	0.7	1.5	1.5	1.5	23.3	20.1		
T.O. Visharam	164	6,286	6,286	237	377	18	...	1	17	18	97	155	2.8	...	0.2	2.7	0.2	1.6	1.5	1.5	1.5	1.5	
T.O. Aliyabad	165	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ramnad—		28,066	1,988	44.3	...	5	...	...	...	159	45	1	1	1	1	16	487	763	...	...	30.9	30.9
M.T.O. Sriyallipettur	166	28,412	6,052	22.9	...	2	...	...	...	180	15	36	1	1	1	2	...	...	...	...	20.5	20.5
T.O. Aruppukkodi	167	26,681	3,914	1.6	...	1	...	...	...	107	58	6	2	3	4	...	...	...	...	12.3	12.3	
T.O. Vizhupuram	168	21,355	1,418	20.7	9	...	...	...	...	64	45	13	2	3	4	...	...	...	...	17.5	17.5	
T.O. Paramangudi	169	18,704	28.0	32	5	...	...	...	...	82	16	38	1	1	1	2	...	...	...	...	22.8	22.8
T.O. Aruppukkodi	170	16,513	478	28.9	95	...	...	...	...	87	10	5	2	1	1	1	...	...	...	...	10.6	10.6
T.O. Paramangudi	171	16,145	31.0	31.0	1.8	...	...	...	...	11.9	102	2	1	1	1	1	...	...	...	...	30.1	30.1
T.O. Kili-Kare	172	14,048	1.34	9.7	84	...	...	...	...	22	8	2	1	1	1	1	...	...	...	...	18.9	18.9
T.O. Karikkudi	173	14,208	489	34.1	...	...	...	...	...	60	6	12	3	1	1	1	...	...	...	...	20.2	20.2
T.O. Sivakasi	174	14,029	5.6	36.1	1	...	...	...	...	40	12	3	1	1	1	1	...	...	...	...	21.7	21.7
T.O. Sivakasi	175	13,321	1.63	12.2	107	...	...	...	...	61	27	1	1	1	1	1	...	...	...	...	18.1	18.1
T.O. Devakottai	176	10,685	1.90	17.8	107	...	...	...	...	39	21	10	1	1	1	1	...	...	...	...	14.0	14.0
T.O. Elangavalloor	177	10,721	1.67	1.67	1.67	...	...	...	...	16	10	1	1	1	1	1	...	...	...	...	10.5	10.5
T.O. Ramangudi	178	9,680	1.66	16.3	34	6	...	...	...	76	15	16	5	5	5	5	...	...	...	...	11.7	11.7
T.O. Ramangudi	179	9,390	1.64	16.2	5	...	...	...	...	41	10	2	1	1	1	1	...	...	...	...	11.7	11.7
T.O. Tirumangudi	180	8,487	30.4	37.6	13	...	...	...	...	21	20	2	1	1	1	1	...	...	...	...	15.3	15.3
T.O. Abiniam	181	8,012	32.4	40.2	23	1	...	...	...	41	108	32	1	1	1	1	...	...	...	...	24.3	24.3
T.O. Varkasiruppu	182	7,987	1.64	20.6	2	...	...	...	...	40	91	1	1	1	1	1	...	...	...	...	11.3	11.3
T.O. Kanchi	183	7,946	1.27	18.9	10	1	...	...	...	47	25	9	1	1	1	1	...	...	...	...	22.1	22.1
T.O. Sodhar	184	6,946	1.17	18.9	10	1	...	...	...	50	19	1	1	1	1	1	...	...	...	...	17.5	17.5
T.O. Tirumangadu	185	5,805	1.29	22.2	1	1	...	...	...	39	11	6	1	1	1	1	...	...	...	...	25.9	25.9
T.O. Puliampatti	186	5,184	1.15	18.2	...	...	...	...	...	18	11	6	1	1	1	1	...	...	...	...	8.8	8.8
T.O. Mananadurai	187	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Salem—		89,163	9,274	55.3	1	1	2	...	...	25	263	1.4	0.2	0.3	0.8	29	1,315	1,901	0.02	0.02	22.2	22.2
M.T.C. Salem	188	...	...	...	...	...	...	...	...	1	1	1	1	1	1	1	...	...	...	...	18.7	18.7
T.O. Rasipuram	189	15,238	569	37.3	6	...	...	...	...	25	46	1	1	1	1	1	...	...	...	...	19.2	19.2
T.O. Krishnagiri	190	10,982	946	31.5	44	3	...	...	...	12	40	3	2	2	2	2	...	...	...	...	21.4	21.4
T.O. Dharmapuri	191	8,455	854	64.8	1	1	1	1	1	11	27	2	1	1	1	1	...	...	...	...	15.4	15.4
T.O. Hosur	192	5,913	162	26.7	11	1	...	...	...	6	14	11	1	1	1	1	...	...	...	...	13.8	13.8
T.O. Kaveripattinam	193	5,171	100	21.1	11.0	11.0
South Arcot—		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
M.T.C. Cuddalore	194	56,674	2,126	37.6	21	2	...	...	...	204	145	95	2	1	1	4	489	717	...	...	33.6	33.6
M.T.C. Chidambaram	195	21,327	686	20.8	...	...	...	...	...	118	88	8	...	...	...	...	...	...	...	...	17.4	17.4
T.O. Avur	196	16,187	219	18.0	4	1	...	...	...	24	102	145	1	1	1	1	...	...	...	...	21.4	21.4
T.O. Parur	197	16,187	846	59.3	17	1	...	...	...	63	26	244	1	1	1	1	...	...	...	...	15.4	15.4
T.O. Port Novo	198	16,887	908	10.6	11	1	...	...	...	76	20	104	1	1	1	1	...	...	...	...	13.8	13.8
T.O. Tirudivulam	199	16,804	251	18.2	4	1	...	...	...	11	14	163	1	1	1	1	...	...	...	...	19.5	19.5
T.O. Villupuram	200	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	201	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	202	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	203	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	204	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	205	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	206	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	207	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	208	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	209	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	210	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	211	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	212	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	213	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	214	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	215	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	216	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	217	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	218	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	219	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	220	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	221	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	222	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	223	15,604	413	30.6	12	1	...	...	...	57	25	299	1	1	1	1	...	...	...	...	22.3	22.3
T.O. Villupuram	224	15,604	413	30.6	12	1	...	...	...	57	25											

VI.—Births and Deaths registered from Different Causes in the districts and towns of the Madras Presidency during the year 1918—cont.

Ratio of deaths per 1,000 of population.											
1	2	3	4	5	6	7	8	9	10	11	12
Districts and towns.				Births.		Injuries.					
Population for which returns were received.						Suicides, and homicides, and homicide by wilful breach of peace.					
Native.	Native.	Native.	Native.	Native.	Native.	Native.	Native.	Native.	Native.	Native.	Native.
<i>B.—Towns—cont.</i>											
96	South Canara— M.T.O. Mangalore	48,442	1,4614	3373	2	1	283	61	184	128	1
97	T.O. Udupi	366	327	6	...	...	32	4	...	1	2
98	T.C. Kasargod	270	301	...	3	...	16	7	...	1	...
99	T.C. Malabar	5,360	208	388	2	...	11	11	17	17	1
100	Tadikere— M.T.O. Tadikere	60,341	2,292	3870	72	24	...	106	357	1	1
101	M.T.O. Kumbakonam	64,647	1,803	2749	68	13	...	263	188	128	...
102	M.T.O. Mayavaram	27,121	905	324	2	...	169	85	...	1	2
103	M.T.O. Negapatam	69,168	1,638	272	96	1	38	371	308	155	1
104	M.T.O. Mannargudi	21,389	720	320	68	49	...	59	85	17	1
105	T.O. Tiruvannamalai	16,408	819	240	10	...	80	77	38	...	1
106	T.C. Tiruvannamalai	14,362	468	320	12	...	89	25	2	...	...
107	T.C. Tranquebar	13,298	400	357	5	3	...	33	16	...	...
108	T.C. Tiruvaiyaru	12,552	361	281	1	...	49	9	1	1	1
109	T.O. Shiyamalapet	11,116	316	251	56	...	32	10	10	...	5
110	T.O. Adirampatnam	10,638	325	251	5	...	69	37	4	...	1
111	T.O. Ayamponpettai	9,754	264	271	6	...	42	2	...	...	...
112	T.O. Muttupetram	9,322	265	271	6	...	60	15	15	...	...
113	T.C. Pettankottai	8,675	324	245	46	...	37	18	0	...	1
114	T.C. Tiruvakal	8,100	364	151	3	...	...	2	2	2	2
115	T.C. Tirumalai	7,701	237	308	9	...	16	11	1	1	1
116	T.C. Tiruthattuppani	6,015	100	310	42	1	...	15	10	12	1
117	T.C. Kudiyatalai	5,973	160	208	28	...	27	4	4	4	2
118	T.C. Nannilam	5,382	176	327	29	7	...	16	9	14	...
119	Tiruvelli— M.T.O. Tiruvelli	4,926	1,426	480	149	2	...	104	238	60	1
120	M.T.O. Palancottah	4,4039	1,619	387	25	...	...	124	383	203	1
121	M.T.O. Tuticorin	10,185	1,358	358	12	2	...	102	175	77	1
122	T.O. Tiruchendur	25,151	973	116	82	...	101	16	91	1	1
123	T.C. Kulasankapattinam	21,372	612	235	72	...	98	3	3	...	1
124	T.C. Tenkasi	19,640	373	15	15	...	93	49	...	4	1
125	T.O. Kallidukurichi	17,288	659	477	16	...	65	27	27	1	1
126	T.O. Kadayanallur	17,077	650	332	80	...	68	43	14	...	2
127	T.C. Virayachallur	16,936	386	242	12	...	45	6	94	...	3
128	T.C. Poliyarkudi	15,483	603	357	...	...	41	9	20	...	1
129	T.O. Sankuruthiyur	15,182	586	3816	...	...	20	16	21	1	1
130	T.C. Ambasamudram	15,250	422	28	...	...	35	25	23	18	1
131	T.C. Kadayanallur	13,798	327	21	16	...	27	16	16	22	1
132	T.C. Surandalai	13,149	427	325	3	...	65	17	21	1	1
133	T.C. Surandalai	12,862	267	207	18	...	134	10	...	...	...
134	T.C. Koyyalpatnam	12,824	421	343	24	...	8	...	62	11	1
135	T.C. Srivilliputhur	12,527	405	374	19	...	46	11	11	2	...
136	T.C. Srivilliputhur	12,156	387	38	8	...	387	8	11	2	...
137	T.C. Melaservall	10,071	361	358	8	...	...	...	...	2	...

No. VI.—Births and Deaths registered from Different Causes in the districts and towns of the Madras Presidency during the year 1913—cont.

1	2	3	4	5	6	7	8	9	10	11	Injuries.	From all causes.	From all causes, 5 years.	14				
												Births per 1,000 of population.	Deaths.	For year, the mean of 5 years.				
B.—Towns—cont.																		
238	T.T.C. Andavanallur	9,882	403	40·8	9	...	...	63	4	1	...	...	198	265	14·0	
239	T.T.C. Ettiyapuram	8,636	139	10·1	...	...	...	25	5	...	...	...	74	104	8·5	
240	T.T.C. Nangakarai	971	32·8	...	...	...	...	81	4	3	...	...	163	187	9·7	
241	T.C. Vadiakken Valiyur	261	34·1	2	...	...	...	60	5	2	...	...	162	221	18·8	
242	T.C. Sattankulam	262	35·9	6	...	...	...	23	4	1	...	...	128	168	24·2	
243	T.C. Alvar Tirunagari	7,440	210	38·7	29	...	...	34	13	1	...	...	178	281	41·2	
244	T.C. Ponnaiyankal	6,820	222	35·3	3	...	...	20	13	1	...	...	118	118	38·3	
245	T.C. Kolpatti	6,290	167	33·3	11	...	...	1	1	1	...	...	126	126	35·9	
246	M.T.C. Trichinopoly	123,513	4,036	32·9	161	83	2	926	451	...	...	...	16	2,492	3,481	13·3
247	M.T.C. Trichinopoly	24,700	740	29·8	13	17	...	87	82	49	...	...	6	307	640	9·5
248	M.T.C. Karaikudi	17,674	607	31·3	64	-	...	...	...	...	...	...	6	247	635	8·6
249	T.C. Tiruvarur	13,219	273	30·8	...	...	...	63	14	2	...	...	...	...	...	11·8
250	T.C. Palaiyur	9,277	362	37·9	4	...	...	78	10	...	...	...	...	17	209	12·6
251	T.C. Sendamangalam	9,166	831	41·1	2	3	...	64	6	...	...	...	5	135	203	12·7
252	T.C. Arayattur	9,164	222	36·9	...	...	...	14	22	8	...	...	11	114	171	22·1
253	T.O. Andalaiyam	6,737	253	31·8	4	...	...	19	24	5	...	...	1	925	160	14·4
254	T.O. Udalaiyurpalayam	6,739	302	29·9	1	...	...	47	3	7	...	...	1	62	110	10·6
255	T.C. Namakkal	5,186	506	38·9	2	...	...	53	12	6	...	...	8	175	93	28·3
256	M.T.C. Vizagapatam	43,413	1,290	29·7	...	10	...	216	130	127	1	...	9	...	1,066	0·9		
257	M.T.C. Bimlipatnam	9,314	315	33·8	...	2	1	30	43	36	...	1	1	67	180	...		
258	M.T.C. Vizianagram	37,550	1,307	34·8	...	...	...	315	286	37	1	14	1	17	221	8·4
259	M.T.C. Anakapalle	20,626	676	32·8	...	11	...	145	97	40	...	1	7	2	...	7·0		
260	M.C. Bobili	18,261	418	29·9	2	...	...	167	2	5	...	...	3	...	211	8·6
261	T.C. Salai	17,504	699	34·0	...	...	...	274	1	...	...	...	3	...	274	13·5
262	T.C. Sarevadipuram	16,773	175	10·4	...	...	...	162	1	...	...	...	1	...	97	0·1
263	T.C. Narasipetam	11,916	197	17·5	...	...	...	69	1	...	...	...	1	...	72	6·1
264	T.C. Palkondi	10,886	288	26·5	...	...	...	101	2	...	...	...	2	...	160	9·3
265	T.C. Yelamanchili	7,036	929	32·4	1	...	...	60	28	7	...	...	1	2	161	16·5
266	T.C. Mundgod	6,011	137	28·7	...	...	...	101	60	...	...	...	1	7	67	10·4
267	T.C. Omannametangi	6,462	127	19·7	...	...	...	137	4	21	...	...	2	...	7	13·3
268	T.C. Sengavarpukota	6,886	128	29·0	...	...	...	7	82	...	...	...	3	...	85	17·1
269	T.C. Virgatam	5,921	235	39·7	...	...	...	...	...	...	...	...	19	101	...	...
270	Total, Town Circles	4,381,816	1,65,832	32·2	4,538	1,240	22,471	17,836	8,176	85	94	878	126	38	1,221	126,409	14·1	
271	Total, Rural Districts	35,176,340	1,138,246	32·3	23,182	13,502	246,653	24,375	20,531	630	777	5,829	2,386	102	6,524	3,8,248	20·8	
272	Total, Madras Presidency	40,006,755	1,288,018	32·2	37,730	14,802	6,130	288,024	63,711	38,327	715	871	6,207	2,512	140	10,445	416,482	24·0

Note.—Hosur was constituted into a Municipality during the year—vide G.O. No. 2334 M., dated the 6th December 1912.

NO. VII.—Deaths registered from cholera in the districts of the Madras Presidency during each month of the year 1913.

1913.—Deaths registered from Smallpox in the districts of the Madras Presidency during each month of the year 1913.

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No. IX.—Deaths registered from Fevers in the districts of the Madras Presidency during each month of the year 1913

Number.	Districts.	Circles of registration.		Villages.		5		7		8												
		1	2	3	4	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Ratio of deaths per 1,000 of population.	Mean ratio for previous 5 years per 1,000.				
1	Anantapur	...	22	20	846	345	290	186	168	183	175	206	205	219	184	239	262	2,685	2·7	2·9		
2	Bellary	...	20	20	949	450	144	152	170	244	149	194	200	193	179	185	291	2,318	2·6	2·4		
3	Chingleput	...	20	20	2,167	772	448	391	500	401	390	345	368	358	360	429	1,040	2,384	3·3	3·5		
4	Chittor	...	14	14	2,447	2,447	799	619	513	543	519	675	598	603	419	419	2,355	7,752	3·742	3·6		
5	Coimbatore	...	21	17	1,350	668	552	557	616	400	945	845	547	549	544	540	506	2,722	2,946	6·0	6·7	
6	Cuddapah	...	17	17	882	882	760	760	879	659	659	659	659	659	666	666	3,667	3,496	6·48	6·7		
7	Ganjam Plains Agency	...	18	18	4,154	3,839	1,773	9	12	1	1,801	2,088	1,874	1,861	2,047	2,306	2,115	2,142	12,078	13·9	12·8	
8	Godavari Plains Agency	...	6	6	2,058	46	1,782	1,782	1,782	1,782	1,782	1,782	1,782	1,782	1,782	1,782	1,782	1,782	1,782	12·8	12·5	
9	Total	...	24	24	6,210	3,885	1,467	883	833	833	1,467	887	885	885	1,467	2,028	2,356	2,131	2,115	12,169	13·9	12·8
10	Guntur	...	21	21	945	1,426	1,020	1,114	1,222	1,447	1,895	1,677	1,114	1,222	1,447	1,895	1,677	1,590	1,590	9,479	1,572	1,527
11	Kurnool	...	26	26	1,715	1,169	947	991	1,044	1,229	1,391	1,478	1,705	1,688	1,705	1,688	1,688	1,647	1,647	8,681	8,162	8·7
12	Madras	...	12	12	809	722	669	785	857	705	857	765	783	917	1,045	1,024	1,024	1,024	1,024	5,323	10,823	11·5
13	Madura	...	1	1	1	1	1	1	1	496	405	387	344	327	291	190	245	1,873	1,873	1,873	1,873	
14	Malabar	...	18	18	2,218	767	2,929	2,876	2,438	2,326	650	650	650	650	650	650	650	650	1,154	1,154	1,154	
15	Nellore	...	21	21	1,602	1,077	1,239	847	886	833	886	833	886	833	886	833	886	886	13,077	12,402	25,479	
16	Nilgiris, The	...	6	6	57	57	58	46	69	71	99	103	99	104	104	104	104	1,045	1,045	1,045	1,045	
17	North Arcot	...	28	26	2,326	670	498	367	333	310	329	350	345	378	351	363	427	461	2,297	4,518	7·2	
18	Renand	...	81	80	3,408	820	1,023	786	788	694	672	695	858	718	735	868	886	1,238	9,906	6·3	6·0	
19	Salem	...	15	14	2,255	972	1,019	661	648	617	609	777	785	864	864	945	4,932	4,932	5·4	5·4		
20	South Arcot	...	19	19	2,351	1,079	1,281	938	852	904	1,054	986	777	976	801	839	1,078	1,281	9,981	11,912	5·1	
21	South Canara	...	11	11	805	625	1,277	999	836	701	620	649	789	740	672	607	560	618	4,543	9,068	7·9	
22	Tanjore	...	29	29	2,527	1,456	948	648	685	685	684	685	768	738	667	667	661	4,032	4,187	8,219	8·4	
23	Tirunelveli	...	35	34	1,168	934	1,078	750	600	633	552	552	552	548	776	1,136	4,032	4,219	8,251	4·7	4·9	
24	Trichinopoly	...	17	17	1,381	1,084	837	651	656	843	695	817	912	805	848	848	848	5,119	10,989	4·9	4·8	
25	Vizagapatam Plains	...	28	28	2,609	2,198	3,165	2,451	2,304	2,192	2,447	2,628	2,447	2,192	2,192	3,103	2,785	3,048	3,400	16,796	13,122	16·0
	Total, Madras Presidency	...	500	490	44,058	25,477	27,110	19,911	19,429	19,867	20,110	21,323	22,920	24,157	21,698	26,979	135,858	132,166	268,024	6·9	6·7	

No. X.—Deaths registered from Dysentery and Diarrhoea in the districts of the Madras Presidency during each month of the year 1913.

1 Number.	2 Districts.	3 Choles of registration.	4 Villages.	5					6			7			8				
				January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Ratio of deaths per 1,000 of Population.	Mean ratio per 1,000 for previous 5 years.		
1 Anantapur	22	18	846	246	65	60	63	45	61	68	61	63	79	405	369	774	0.8	1.3	
2 Bellary	20	20	949	286	94	72	80	98	102	123	154	117	156	152	703	1,456	1.5	2.0	
3 Chingleput	20	19	2,157	640	374	287	282	253	244	275	344	265	336	388	1,831	1,692	2.6	2.6	
4 Chittoor	14	14	2,447	1,733	196	118	108	86	107	119	129	160	142	133	268	886	847	1.4	1.3
5 Coimbatore	22	21	1,350	688	529	410	400	368	323	420	435	475	402	456	501	466	2,634	2.4	2.3
6 Cuddapah	17	14	882	628	78	60	41	92	43	42	57	52	103	56	46	51	976	845	0.8
7 Ganjam Plains	18	18	4,154	627	124	69	142	170	152	170	257	239	208	164	151	163	1,103	906	1.1
Ganjam Agency	6	1	2,056	1	...	...	...	...	...	...	1	...	...	...	...	1	...	0.9	...
Total ...	24	19	6,210	628	124	69	142	170	152	170	257	240	208	164	151	163	1,104	906	1.1
Godavari Plains	17	17	833	182	76	22	68	41	64	82	82	88	88	54	49	63	369	399	0.5
Godavari Agency	5	5	1,162	86	16	5	6	6	4	7	3	6	6	17	5	6	48	38	0.4
Total ...	22	22	1,935	268	92	27	64	50	68	89	85	94	92	71	64	68	417	437	1.0
9 Guntur	21	19	945	359	52	111	104	102	101	82	175	227	150	88	77	93	696	676	0.8
10 Kistna ...	26	25	1,715	819	64	55	70	73	95	97	172	178	98	100	71	74	628	618	0.8
11 Kurnool ...	12	12	809	124	43	29	21	28	16	21	75	42	68	40	68	40	476	466	0.9
12 Madras ...	1	1	1	547	480	461	417	392	443	421	417	286	291	343	604	2,577	2,543	10.2	
13 Madura ...	19	19	1,108	605	379	164	164	164	164	162	208	226	220	245	305	463	1,497	1,400	1.4
14 Malabar ...	18	17	2,213	717	2,104	1,637	1,112	921	870	915	1,223	1,134	428	352	529	444	6,247	11,669	3.9
15 Nilgiris ...	21	21	1,602	148	77	42	85	37	48	42	65	48	515	589	602	1,036	1,086	2,122	1.6
16 Nilgiris, The ...	6	6	57	38	53	27	33	32	57	83	59	41	62	53	46	35	293	258	4.8
17 North Arcot ...	29	28	2,328	849	628	376	343	285	264	309	396	342	379	487	660	2,481	2,420	4,811	2.4
18 Ramnâd ...	31	29	3,403	150	153	119	116	126	149	99	94	127	120	181	223	415	970	1,925	1.2
19 Salem ...	15	14	9,255	466	270	188	141	125	124	119	125	161	124	186	224	268	1,056	880	2.015
20 South Arcot ...	19	19	2,851	494	462	310	206	216	161	192	283	337	317	322	1,708	1,623	3,331	1.4	
21 South Cannara ...	11	11	805	570	909	493	323	209	191	159	237	192	184	260	395	1,826	3,493	3.2	
22 Tanjore ...	30	29	2,527	778	471	149	136	146	109	122	273	287	257	260	395	622	1,695	3,847	1.3
23 Tirunelveli ...	33	33	1,168	895	270	149	137	102	79	109	128	130	136	229	489	1,058	1,026	2,084	1.3
24 Trichinopoly ...	17	17	1,381	486	177	130	128	129	116	140	207	196	190	198	249	292	1,038	2,147	1.1
25 Visagapatam Plains ...	28	24	2,609	234	54	49	84	55	67	84	89	98	109	80	29	61	428	859	0.6
Total, Madras Presidency ...	500	472	44,056	11,560	8,225	5,652	4,886	4,329	4,181	4,622	5,610	5,176	5,654	7,191	31,860	31,851	66,711	1.6	

APPENDIX.

NO. XI.—Deaths registered from Respiratory Diseases in the districts of the Mahratta Presidency during each month of the year 1913.

NO. XII.—Deaths registered from Plague in the districts of the Madras Presidency during each month of the year 1913.

(Comparative table showing percentage of mortality to total mortality from year to year under each head of death causation.)

Name of municipality.	Drainage.	Water-supply.	Date of completion of works of drainage.	Average annual death-rate since the introduction of drainage system or water-supply.	Percentage of deaths to total mortality under each head of death causation.			Years.	Cholera.	Small-pox.	Fever.	Dysentery and diarrhoea.	All other causes.	Years.	Death-rate.	Average annual death-rate for the five-year period preceding the introduction of drainage system or water-supply.	All other causes.	Percentage of deaths to total mortality under each head of death causation.			Years.	Cholera.	Small-pox.	Fever.	Dysentery and diarrhoea.	All other causes.		
					3	4	5											6	7	8	9	10	11	12	13	14	15	
Adoni	1895	23.6	0.3	38.1	0.3	61.3	1890	19.2	41.9	...	51.6	...	18.4	...	26.7	...	0.4	31.0	38.1	18.1	...	0.3	45.8	48.0	62.7	...
			1896	25.4	1.0	31.2	0.9	66.8	1891	38.1	31.6	...	31.0	...	18.4	...	26.7	...	3.0	30.4	38.1	18.1	...	0.3	45.8	48.0	62.7	...
			1897	37.9	9.3	31.7	0.9	55.1	1892	31.7	22.2	...	21.7	...	18.4	...	26.7	...	0.3	21.7	31.7	18.1	...	0.3	48.0	48.0	62.7	...
			1898	26.5	...	29.7	5.3	64.7	1893	22.2	24.3	...	25.4	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1899	24.1	0.1	22.1	2.4	75.4	1894	24.3	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1900	24.4	...	34.9	6.3	59.8	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1901	20.1	0.3	30.0	2.9	66.8	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1902	56.5	11.2	2.4	0.9	85.5	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1903	23.1	...	0.6	0.0	10.9	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1904	71.3	...	2.8	2.6	94.6	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1905	31.1	0.3	17.2	5.7	65.5	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1906	38.8	18.4	0.4	5.1	16.8	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1907	24.2	0.3	1.2	3.8	18.2	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1908	26.3	6.0	...	10.9	10.4	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1909	25.5	1.2	1.2	1.2	13.5	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1910	30.1	...	0.3	0.3	9.5	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1911	33.6	...	0.4	0.4	12.7	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1912	33.3	6.9	...	4.8	11.6	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1913	28.4	...	4.8	4.8	...	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1909	38.7	...	1.7	1.7	11.9	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1910	42.6	1.9	0.1	1.9	13.4	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1911	30.5	12.2	0.6	13.7	10.8	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1912	30.4	1.0	...	11.3	10.3	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1913	26.1	...	...	10.8	9.2	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1908	20.4	1.0	...	19.9	12.2	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1909	25.8	...	...	23.9	18.8	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1905	28.8	2.8	11.0	1.1	12.6	11.0	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1906	37.5	11.0	...	12.6	12.6	11.0	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1909	...	...	...	...	...	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1903	...	...	...	...	...	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1908	20.4	1.0	...	19.9	12.2	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1904	25.8	...	...	23.9	18.8	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1905	28.8	2.8	11.0	1.1	12.6	11.0	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1906	37.5	11.0	...	12.6	12.6	11.0	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1909	...	...	...	...	...	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1903	...	...	...	...	...	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1908	20.4	1.0	...	19.9	12.2	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1904	25.8	...	...	23.9	18.8	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1905	28.8	2.8	11.0	1.1	12.6	11.0	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1906	37.5	11.0	...	12.6	12.6	11.0	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1909	...	...	...	...	...	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1903	...	...	...	...	...	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1908	20.4	1.0	...	19.9	12.2	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1904	25.8	...	...	23.9	18.8	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1905	28.8	2.8	11.0	1.1	12.6	11.0	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1906	37.5	11.0	...	12.6	12.6	11.0	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1909	...	...	...	...	...	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1903	...	...	...	...	...	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1908	20.4	1.0	...	19.9	12.2	...	...	...	...	...	...	18.4	...	26.7	...	0.3	25.0	37.0	18.1	...	0.3	48.0	48.0	62.7	...
			1904	25.8	...	...	23.9	18.8</td																				

No. XII.—Statement prescribed by the Government of India, Home Department (Sanitary), in Letter No. 10—326, dated 8th December 1894, communicated with
G. O. Mis. No. 2654 I., dated 20th December 1894—cont.

(Comparative table showing percentage of mortality to total mortality from year to year under each head of death causation.)

Name of municipality.	Drainage.	Water-supply.	Date of completion of works of introduction of drainage system or water-supply.	Average annual death-rate.	Years.	Percentage of deaths to total mortality under each head of death causation.		Average annual death-rate for the five-year period preceding the intro-duction of drainage system or water-supply.	Years.	Percentage of deaths to total mortality under each head of death causation.		All other causes.					
						Diseases, & dr.				Diseases, & dr.							
						Hevers.	Small-pox.			Hevers.	Small-pox.						
Coonoor—coast.	1903	..	..	1.8	1.8	10.5	10.5	1.8	1.8	1902	21.8	0.1	22.6	12.5	64.8
Coonoor—coast.	1908	30.6	2.2	1.8	1.8	12.9	13.7	69.4	..	..	..	..	..	..	..
Coonoor—coast.	1909	35.4	..	17.1	13.2	10.7	5.90	..	..	..	..	..	..	..	..
Coonoor—coast.	1910	30.8	0.2	14.5	14.3	7.0	6.0	..	..	..	..	..	..	..	..
Coonoor—coast.	1911	23.1	0.6	0.2	21.8	11.8	6.0	..	..	..	..	..	..	..	..
Coonoor—coast.	1912	29.9	2.0	26.1	15.1	5.5	5.5	..	..	..	..	..	..	..	..
Coonoor—coast.	1913	21.3	..	0.1	24.8	9.9	6.2	..	..	..	..	..	..	..	..
Coonoor—coast.	1897	22.3	6.6	0.1	21.3	10.7	6.0	18.02	32.5	2.7	1.5	24.1	12.2	69.5	..
Coonoor—coast.	1898	29.4	1.1	0.6	13.5	18.0	7.8	18.93	38.0	1.3	2.2	26.0	18.0	57.5	..
Coonoor—coast.	1899	29.8	1.9	0.7	2.1	16.5	7.8	18.94	30.6	4.5	0.6	26.8	10.5	57.7	..
Coonoor—coast.	1900	31.2	2.0	1.6	4.5	14.2	7.7	18.95	38.6	5.3	0.8	26.2	11.7	67.0	..
Coonoor—coast.	1901	35.5	2.8	1.0	10.8	17.7	6.7	18.96	38.3	9.6	0.1	28.8	10.6	55.9	..
Coonoor—coast.	1902	32.8	0.1	..	..	..	..	..	..	..	..	..	..	..	..
Coonoor—coast.	1903	32.4	..	0.7	11.6	25.9	6.1	..	..	..	..	..	..	..	..
Coonoor—coast.	1904	32.0	..	..	..	..	..	..	..	..	..	..	..	..	..
Coonoor—coast.	1897	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Coonoor—coast.	1905	28.8	1.2	0.1	6.9	19.7	7.2	..	..	..	..	..	..	..	..
Coonoor—coast.	1906	34.8	6.6	6.0	5.8	18.3	6.9	..	..	..	..	..	..	..	..
Coonoor—coast.	1907	26.8	1.1	..	8.5	5.1	18.2	6.4	..	..	..	..	..	..	..
Coonoor—coast.	1908	28.5	9.3	0.1	4.0	17.5	7.2	..	..	..	..	..	..	..	..
Coonoor—coast.	1909	30.4	..	0.8	8.5	18.4	7.8	..	..	..	..	..	..	..	..
Coonoor—coast.	1910	37.2	..	..	6.8	20.5	7.2	..	..	..	..	..	..	..	..
Coonoor—coast.	1911	30.0	0.2	1.1	8.6	20.3	6.9	..	..	..	..	..	..	..	..
Coonoor—coast.	1912	34.4	4.0	0.1	4.1	13.7	7.8	..	..	..	..	..	..	..	..
Coonoor—coast.	1913	33.4	0.2	1.8	3.6	16.7	7.8	..	..	..	..	..	..	..	..
Coonoor—coast.	1893	31.9	1.6	..	30.6	17.6	5.0	18.88	28.4	..	1.5	34.6	17.6	46.3	..
Coonoor—coast.	1894	31.9	2.6	..	28.0	19.7	4.9	18.97	26.9	5.4	..	27.1	14.7	52.8	..
Coonoor—coast.	1895	27.9	..	..	21.9	18.6	6.4	18.90	42.7	1.5	2.2	39.2	18.7	44.1	..
Coonoor—coast.	1896	41.3	2.8	0.4	22.4	17.6	5.6	18.91	29.4	5.6	2.3	22.5	14.1	55.6	..
Coonoor—coast.	1897	43.8	5.6	0.4	20.8	15.6	5.7	18.92	37.0	0.5	1.8	44.2	16.2	38.8	..
Coonoor—coast.	1898	34.6	..	..	9.4	17.2	6.8	..	..	..	..	..	..	..	..
Coonoor—coast.	1899	36.5	..	1.4	..	..	..	..	..	..	..	..	..	..	..
Coonoor—coast.	1900	36.5	..	..	..	..	..	..	..	..	..	..	..	..	..

APPENDIX.

Comparative table showing percentage of mortality to total mortality from year to year under each head of death causation.)

Comparative table showing recent
G.O. Mis. No. 2654 L., dated 20th December 1894—cont.

(Comparative table showing percentage of mortality to total mortality from year to year under each head of death causation.)

ellore	..	1908	...	26.1	47.1	0.2	27.6	51.1	0.2	27.1	51.1	0.2	27.1	51.1	0.2	27.1	51.1	0.2	27.1	51.1	0.2	
				25.9	48.5	10.0	31.9	52.1	0.1	24.0	52.1	0.1	23.8	52.1	0.1	23.8	52.1	0.1	23.8	52.1	0.1	
1910	35.4	1.9	1.9	39.8	41.0	0.5	36.6	17.9	2.2	36.6	17.9	2.2	36.6	17.9	2.2	36.6	17.9	2.2	36.6	17.9	2.2	
				32.7	47.6	0.1	38.0	20.0	8.4	38.0	20.0	8.4	38.0	20.0	8.4	38.0	20.0	8.4	38.0	20.0	8.4	
1911	28.9	1.5	0.3	48.8	6.6	41.8	41.8	19.7	19.2	0.9	38.4	19.2	0.9	38.4	19.2	0.9	38.4	19.2	0.9	38.4	19.2	0.9
				19.2	28.9	0.4	52.4	71.6	...	...	...	...	...	...	...	...	...	...	...	...	...
1912	52.4	0.4	0.3	16.1	5.9	71.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
				19.8	28.6	0.5	16.2	10.3	78.0	1895	23.5	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
1909	19.0	10.0	0.2	28.1	...	26.2	11.8	11.7	78.3	1896	30.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
				19.02	37.9	0.2	10.6	12.5	83.6	1897	30.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
1913	52.4	0.4	0.3	16.1	5.9	71.6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
				19.8	28.6	0.5	16.2	10.3	78.0	1896	23.5	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
1905	31.8	0.6	0.5	25.0	...	24.4	12.0	12.0	83.6	1898	26.1	...	...	...	...	...	...	...	...	...	...	...
				19.05	35.4	0.2	0.2	0.2	14.1	18.2	82.6	...	...	...	...	...	...	...	...	...	...	...
1906	29.6	0.2	0.1	1.5	0.2	0.2	8.8	10.8	82.2	1899	26.1	...	...	...	...	...	...	...	...	...	...	...
				19.07	31.8	0.3	0.3	0.3	5.7	10.8	82.2	...	...	...	...	...	...	...	...	...	...	...
1908	31.8	0.3	0.2	1.5	0.2	0.2	8.8	11.8	85.2	1900	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.09	35.8	0.2	0.2	0.2	2.7	15.3	80.5	...	...	...	...	...	...	...	...	...	...	...
1909	28.4	0.6	0.5	1.5	0.6	0.6	2.4	12.0	85.0	1901	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.10	26.2	0.7	0.7	0.7	1.1	11.8	88.2	...	...	...	...	...	...	...	...	...	...	...
1910	29.7	0.9	0.8	1.5	0.9	0.9	2.4	12.0	85.4	1902	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.11	29.1	0.9	0.9	0.9	2.6	12.0	85.4	1903	23.5
1911	31.8	0.3	0.2	1.5	0.2	0.2	8.8	10.8	82.2	1904	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.12	31.8	0.3	0.3	0.3	5.7	10.8	82.2	1905	23.5
1912	31.8	0.3	0.2	1.5	0.2	0.2	8.8	11.8	85.2	1906	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.13	32.4	0.3	0.3	0.3	5.7	10.8	82.2	1907	23.5
1905	28.4	0.6	0.5	1.5	0.6	0.6	2.4	12.0	85.0	1908	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.14	31.8	0.3	0.3	0.3	5.7	10.8	82.2	1909	23.5
1906	31.8	0.3	0.2	1.5	0.2	0.2	8.8	10.8	82.2	1910	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.15	32.4	0.3	0.3	0.3	5.7	10.8	82.2	1911	23.5
1907	32.4	0.3	0.2	1.5	0.2	0.2	8.8	11.8	85.2	1912	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.16	32.4	0.3	0.3	0.3	5.7	10.8	82.2	1913	23.5
1908	32.4	0.3	0.2	1.5	0.2	0.2	8.8	11.8	85.2	1914	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.17	32.4	0.3	0.3	0.3	5.7	10.8	82.2	1915	23.5
1909	32.4	0.3	0.2	1.5	0.2	0.2	8.8	11.8	85.2	1916	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.18	32.4	0.3	0.3	0.3	5.7	10.8	82.2	1917	23.5
1910	32.4	0.3	0.2	1.5	0.2	0.2	8.8	11.8	85.2	1918	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.19	32.4	0.3	0.3	0.3	5.7	10.8	82.2	1919	23.5
1911	32.4	0.3	0.2	1.5	0.2	0.2	8.8	11.8	85.2	1920	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.20	32.4	0.3	0.3	0.3	5.7	10.8	82.2	1921	23.5
1912	32.4	0.3	0.2	1.5	0.2	0.2	8.8	11.8	85.2	1922	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.21	32.4	0.3	0.3	0.3	5.7	10.8	82.2	1923	23.5
1913	32.4	0.3	0.2	1.5	0.2	0.2	8.8	11.8	85.2	1924	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.22	32.4	0.3	0.3	0.3	5.7	10.8	82.2	1925	23.5
1914	32.4	0.3	0.2	1.5	0.2	0.2	8.8	11.8	85.2	1926	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.23	32.4	0.3	0.3	0.3	5.7	10.8	82.2	1927	23.5
1915	32.4	0.3	0.2	1.5	0.2	0.2	8.8	11.8	85.2	1928	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.24	32.4	0.3	0.3	0.3	5.7	10.8	82.2	1929	23.5
1916	32.4	0.3	0.2	1.5	0.2	0.2	8.8	11.8	85.2	1930	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.25	32.4	0.3	0.3	0.3	5.7	10.8	82.2	1931	23.5
1917	32.4	0.3	0.2	1.5	0.2	0.2	8.8	11.8	85.2	1932	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.26	32.4	0.3	0.3	0.3	5.7	10.8	82.2	1933	23.5
1918	32.4	0.3	0.2	1.5	0.2	0.2	8.8	11.8	85.2	1934	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.27	32.4	0.3	0.3	0.3	5.7	10.8	82.2	1935	23.5
1919	32.4	0.3	0.2	1.5	0.2	0.2	8.8	11.8	85.2	1936	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.28	32.4	0.3	0.3	0.3	5.7	10.8	82.2	1937	23.5
1920	32.4	0.3	0.2	1.5	0.2	0.2	8.8	11.8	85.2	1938	23.5	...	...	...	...	...	...	...	...	...	...	...
				19.29	32.4	0.3	0.3	0.3	5.7	10.8	82.2	1939	23.5
1921	32.4	0.3																				

APPENDIX.

Comparative table showing percentage of mortality from year to year under each head of death causation.

Vizagapatam	1903	29.5	...	19.7	24.7	55.6	1898	28.6	...	0.2	25.2	20.0	54.6
	1904	32.1	...	22.9	20.5	58.8	1899	31.6	...	0.1	26.8	24.0	49.1
	1905	29.8	0.4	20.1	18.9	60.6	1900	33.1	0.8	0.1	21.3	20.8	57.1
	1906	38.8	1.8	25.3	17.8	55.5	1901	26.8	0.1	...	20.3	18.9	59.9
	1907	25.5	0.1	0.4	32.6	18.1	1902	26.6	...	19.8	20.1	...	60.1
	1908	36.2	7.1	8.6	27.0	12.6	49.7	...	...	...	...	...	...
	1909	27.8	0.1	8.5	27.3	10.8	58.8	...	...	...	...	...	...
	1910	32.9	0.2	1.0	25.5	15.7	57.6	...	...	...	...	...	...
	1911	27.0	0.3	0.1	29.7	17.6	52.8	...	...	...	...	...	...
	1912	32.6	8.0	0.1	23.8	13.8	64.3	...	...	...	...	...	...
		1913	24.3	...	3.8	26.5	12.8	63.4	...	...	...	...	...



THE
 TWENTY-FOURTH ANNUAL REPORT
 OF THE
 SANITARY ENGINEER TO THE GOVERNMENT OF
 MADRAS,
 1913.

Period covered by this report.—On the question raised by the Sanitary Engineer in February 1913 whether, in conformity with the decision of Government in their Order No. 2285 M., dated 2nd December 1912, that his annual programmes of investigation and design of Major Sanitary Schemes should relate to the official year and not to the calendar year as in the past, the annual sanitation reports should not also cover the same period, it was decided by Government in their Order No. 944 L., dated 4th June 1913, in favour of the calendar year so far as these reports alone were concerned. The last report covered the official year, having been prepared and submitted prior to the decision. The work done from the 1st January to the 31st March 1913 having thus been already dealt with in the last report, the present report will practically relate to the period between the 1st April and 31st December 1913. This want of harmony between the respective periods covered by the programme and the sanitation report is an inconvenience but, under the existing rules, an unavoidable one.

Programme of work for the year.—According to the latest sanctioned programme for the year 1913–14 (G.O. No. 1285 M., dated 5th July 1913) the Sanitary Engineer's work for the year comprised (A) Preparation of detailed plans and estimates for the 17 major schemes under A below and (B) Investigation of the 28 major schemes under B:—

(A)—*Schemes to be designed.*

Name of town.					Nature of scheme.
(1) Madura	...	...	...	...	Water-works improvements.
(2) Kumbakōnam	...	...	...	...	Water-supply.
(3) Anantapur	...	...	...	...	Do.
(4) Adōni	...	...	...	...	Water-works improvements
(5) Vizagapatam	...	...	...	...	Do.
(6) Guntūr	...	...	...	...	Do.
(7) Tanjore	...	...	...	...	Do.
(8) Palni	...	...	...	...	Water-supply.
(9) Ootacamund...	...	...	...	...	Drainage improvements.
(10) Cuddalore	...	...	...	...	Water-supply.
(11) Bellary	...	...	...	...	Do.
(12) Kumbakōnam	...	...	...	...	Drainage.
(13) Adōni	...	...	...	...	Do.
(14) Salem	...	...	...	...	Do.
(15) Trichinopoly	...	...	...	...	Do.
(16) Coimbatore	...	...	...	...	Water-supply.
(17) Tinnevelly, Palamcottah and Tuticorin.					Joint water-supply.

(B)—Schemes to be investigated.

Name of town.	Nature of scheme.
(1) Coimbatore ...	Water-supply.
(2) Kumbakōnam	Drainage.
(3) Trichinopoly	Water-works improvements.
(4) Srirangam ...	Water-supply.
(5) Devakottai ...	Do.
(6) Sivaganga...	Do.
(7) Tiruvannāmalai	Do.
(8) Rāmnād	Do.
(9) Cochin	Do.
(10) Mangalore ...	Do.
(11) Rajahmundry	Do.
(12) Calicut	Do.
(13) Salem	Drainage.
(14) Srirangam ...	Do.
(15) Parlākīmedī	Water-supply.
(16) Periyakulam	Drainage.
(17) Tiruvallūr (Union)...	Water-supply.
(18) Ongole ...	Do.
(19) Saidapet (Union) ...	Drainage.
(20) Tinnevelly, Palamcottah and Tuticorin.	Joint water-supply.
(21) Nandyal ...	Water-supply.
(22) Dhone (Union)	Do.
(23) Tindivanam (Union)	Do.
(24) Valavanur (do.)	Do.
(25) Walajabad (do.)	Do.
(26) Gudivada (do.)	Do.
(27) Peddapuram (do.)	Do.
(28) Gudalur, Cumbum, etc. (Unions) ...	Do.

N.B.—Towns in the above list, not marked *Unions* are Municipalities.

WORK DONE ON THE PROGRAMME.

A.—DESIGNING.

(1) *Madura water-works improvements*.—The detailed plans and estimates amounting to 19 lakhs submitted in 1912 for sanction, for abandoning the existing head works and putting in an entirely new gallery and pumping installation at a site called Kochadi 2 miles higher up the river than the existing site and containing a sufficiently extensive and deep water bearing stratum, were remitted back to the Sanitary Engineer during the year with instructions to submit revised proposals for an experimental pumping scheme comprising an infiltration gallery and collecting well with a temporary pumping plant at the Kochadi site, with a view to supplement the supply from the existing system and thus to enable a prolonged and complete test of the new source being conducted before deciding on the abandonment of the existing pumping plant. Plans and estimates were accordingly drawn up afresh and submitted for a supplementary and experimental pumping scheme estimated to cost Rs. 5,68,000 for installation at the beginning, and 10 lakhs inclusive of the additional works and distributing pipes which will follow if the experimental part of the scheme proves a success. These were approved by the Sanitary Board in Proceedings No. 707-S., dated 5th November 1913, and since sanctioned by Government (G.O. No. 264 W., dated 4th February 1914).

(2) *Kumbakōnam water-supply*.—Proposals for additional sub-artesian water works at a site to the south-west of Kumbheswaraswami Temple and estimated to cost Rs. 22,500 for supplementing the existing supply from the pumping installation at the central town borehole lately opened in front of the Someswaraswami Temple, were under scrutiny by the Sanitary Engineer at the end of the year. Plans and estimates have since been submitted in this office No. 176-G., dated 3rd March 1914, to the Sanitary Board through the Sanitary Commissioner.

(3) *Anantapur water-supply*.—Plans and estimates amounting to 2 lakhs (1.74 lakhs as drawn up by the Deputy Sanitary Engineer during the year) for a pumping scheme of supply from a coarse sand layer in the deep bed of the Pandamaneru river $2\frac{1}{2}$ miles above the town, for benefiting an ultimate population of 10,000 (now 8,457) at a 15-gallon rate, drawn up by the Deputy Sanitary Engineer, Northern and Central Circles, were forwarded with this office No. 243-G., dated 30th March 1914, to the Sanitary Board through the Sanitary Commissioner.

(4) *Adoni water-works improvements*.—The Sanitary Engineer's scrutiny of the proposals drawn up by the Assistant Sanitary Engineer, Central Circle, and estimated to cost Rs. 34,000 for augmenting the existing town supply by increasing the catchment area of the storage tank had almost been completed at the end of the year and the proposals have since been forwarded with this office No. 175-G., dated 2nd March 1914, to the Sanitary Board through the Sanitary Commissioner.

(5) *Vizagapatam water-works improvements*.—Plans and estimates aggregating 1 lakh for proposals to supplement the existing town supply by means of additional galleries, were drawn up by the Assistant Sanitary Engineer, Northern Circle, during the year in pursuance of order No. 440 M., dated 3rd March 1913, and have since been forwarded to the Sanitary Board through the Sanitary Commissioner (with this office No. 232-G., dated 27th March 1914).

(6) *Guntur water-works improvements*.—Investigation was in progress during the year. Proposals estimated to cost Rs. 1,35,000 as drawn up by the Assistant Sanitary Engineer, Northern Circle, and Rs. 1,09,120 as revised by the Sanitary Engineer, for a scheme of supply supplementing the existing insufficient supply, and comprising the construction of a gallery 4,000 feet long from a new square deep well excavated near the existing galleries, with pipe conduit, etc., have been forwarded to the Sanitary Board through the Sanitary Commissioner with this office No. 241-G., dated 30th March 1914.

(7) *Tanjore water-works improvements*.—Investigation of proposals to improve the existing supply by removing the head works to a new site, was completed and plans and estimates were approaching completion at the end of the year.

(8) *Palni water-supply*.—Plans and estimates were at the end of the year in an advanced stage of preparation with the Deputy Sanitary Engineer, Southern and Western Circles.

(9) *Ootacamund drainage improvements*.—Detailed plans and estimates amounting to Rs. 2,60,000 for the provision of a new cast-iron main sewer were drawn up by the Deputy Sanitary Engineer during the year. They have since been scrutinized by the Sanitary Engineer and forwarded with No. 239-G., dated 30th March 1914.

(10) *Cuddalore water-supply*.—Plans and estimates aggregating Rs. 7,66,000 for a pumping scheme for supplying an ultimate population of 70,000 at the rate of 15 gallons daily, from the river Ponniar by means of a pumping main serving also as a distributary main and a masonry service reservoir on Capper Hill, $3\frac{1}{2}$ miles from the head works site, were drawn up by the Deputy Sanitary Engineer, Southern and Western Circles, and forwarded in this office No. 204-G., dated 14th March 1914, to the Sanitary Board through the Sanitary Commissioner.

(11) *Bellary water-supply*.—Plans and estimates aggregating 11 lakhs were drawn up by the Deputy Sanitary Engineer, Northern and Central Circles, during the year and submitted by him at the commencement of 1914 to the Sanitary Engineer with whom they are now under scrutiny.

(12) *Kumbakonam drainage*.—The preparation of plans and estimates for this scheme was taken up by the Assistant Sanitary Engineer, Southern Circle, about the end of the year.

(13) *Adoni drainage*.—Plans and estimates aggregating about $2\frac{1}{2}$ lakhs are being drawn up.

(14) *Salem drainage*.—Plans and estimates aggregating about 4 lakhs are expected to be completed in 1914-15.

(15) *Trichinopoly drainage*.—A revised scheme of open drains with intercepting sewers and sewage disposal arrangements estimated to cost $10\frac{1}{2}$ lakhs, for the city of Trichinopoly, and submitted from this office early in 1912 was until late in 1913 under discussion with the Chief Engineer, Sanitary Board and Government relative to the settlement of the question whether to prefer an open or underground system of drains for the city. A partial decision in favour of the former was arrived at and the plans and estimates have lately been referred back by the Chief Engineer to this office for resubmission with fully worked out hydraulic calculations determining the sizes of the drains, suitable designs for pumping pits and night-soil shoots, and a further elucidation of points connected with drain junctions, provision of rates, etc.

(16) *Coimbatore water-supply*.—Preliminary investigation had been completed about the end of 1912 and a report on schemes of supply for the town from four alternative sources, viz. (a) the river Sirumani, (b) sub-artesian water, (c) the river Bhavani and (d) the Singanallur tank, was submitted to Government with this office No. 570-G., dated 31st October 1912. In that report it was recommended that preferential consideration might be given to the scheme marked (a) above which comprised a combined scheme of supply of drinking water as well as hydro-electric power for town lighting, electric power for factories, etc. Orders on this report were awaited at the end of the year.

(17) *Tinnevelly-Palampettah and Tuticorin joint water-supply*.—In connection with the pumping scheme of joint water-supply for the three towns from the Tambraparni estimated to cost $31\frac{1}{2}$ lakhs, and submitted in 1912, further gaugings of the surface flow in the Tambraparni and in the irrigation channels Melakkal and Kilakkal during the hot season were, as ordered by the Chief Engineer, carried out and a report forwarded to him during the year. The joint scheme was in the meantime ordered to be abandoned (G.O. No. 1862 M., dated 30th September 1913) and the cost of an independent scheme of supply for Tuticorin alone from the same source was, as ordered, worked out at 15 lakhs if the pipe delivery main for the first 1½ miles be of steel, and $18\frac{1}{2}$ lakhs if the same be of cast-iron, and furnished to Government by the end of the year.

B.—INVESTIGATION.

(1) *Coimbatore water-supply*.—*Vide* item (16) under A above.

(2) *Kumbakonam drainage*.—Investigation completed on lines of existing streets and lanes, and designing work taken up by the Assistant Sanitary Engineer, Southern Circle—*vide* item 12 under A above.

(3) *Trichinopoly water-works Improvements*.—The Sanitary Engineer's proposal to continue the experiments on the well sunk at Kambarasampettai for augmenting the existing town supply and to put down further deep borings in the neighbourhood was sanctioned during the year (G.O. No. 853 M., dated 28th April 1913) and is being carried out.

(4) *Srirangam water-supply*.—As it is intended to have a combined scheme of supply for both Srirangam and Trichinopoly Municipalities, the experiments referred to in (3) above will also settle the question of head-works for Srirangam.

(5 & 6) *Devakottai and Siraganga water-supplies*.—Out-door work completed and plans and estimates will be drawn up in 1914.

(7) *Tiruvannamalai water-supply*.—During the year the Sanitary Engineer submitted to Government a report formulating proposals estimated to cost Rs. 1,500 for preliminary borings with a view to discover the most feasible and advantageous position for an infiltration gallery; and the proposal was sanctioned by Government in G.O. No. 1795 M., Mis., dated 18th September 1913. Investigation was in progress at the end of the year.

(8) *Ramnad water-supply*.—Investigation was almost completed at the end of the year. The Government was kept informed of the progress of the investigation by preliminary reports.

(9) *Cochin water-supply*.—Boring operations commenced at about the end of the year under the supervision of a boring superintendent and the work is in progress. On the 12th April the boring had reached a depth of 146 feet.

(10) *Mangalore water-supply*.—It being found on further investigation that the Maroli valley scheme for Mangalore would prove prohibitively costly (7 lakhs), a modification of the scheme so as to bring its cost within the limits of the Municipal Council's resources, say, roughly, to $4\frac{1}{2}$ lakhs, by tapping the sub-soil water in the valley, was proposed by the Deputy Sanitary Engineer, Southern and Western Circles, for investigation. The proposal has been approved and a sum of Rs. 2,300 for the investigation sanctioned by Government (G.O. No. 153 M., dated 24th January 1914).

(11) *Rajahmundry water-supply*.—Investigation ordered in G.Os. No. 1594 M., dated 28th August 1912, and No. 312 M., dated 15th February 1913, of a pumping scheme of supply from a site near the right flood bank of the Gôdâvari on the Kovvûr side of the river, and experiments for testing the yield from a well in the Municipal Chairman's garden were in progress. A number of deep borings have also been put down east of the town and between the railway and the river. These borings which reached a depth of over 100 feet disclosed an artesian source of supply which will probably prove the final source of supply to this important town.

(12) *Calicut water-supply*.—The investigation of the Elathur river source, sanctioned in G.Os. No. 907 M., Mis., dated 15th May 1912, and No. 2305 M., Mis., dated 19th November 1913, was in progress at the end of the year.

(13) *Salem drainage*.—Preliminary investigation completed. Plans and estimates will be drawn up by the Deputy Sanitary Engineer, Southern and Western Circles, and submitted in 1914-15.

(14) *Srirangam drainage*.—The Municipal Council is still going on with the work of opening up conservancy lanes, on the completion of which further investigation will be carried out.

(15) *Parlakimedi water-supply and drainage*.—Investigation of a scheme of water-supply and a scheme of drainage for the town were in progress at the end of the year.

(16) *Periyakulam drainage*.—Investigation of a scheme of drainage for the whole town was in progress at the end of the year.

(17) *Tiruvallur water-supply*.—Boring investigation at Periyakuppam was abandoned and fresh proposals are being considered by the Local Board.

(18) *Ongole water-supply*.—An estimate of Rs. 4,000 for further investigation of possible sources of supply for Ongole, ordered in G.O. No. 785 M., dated 17th April 1913, was drawn up before the end of the year and has since been sanctioned by Government in G.O. No. 403 M., Mis., dated 27th February 1914. Investigation will be carried out in 1914.

(19) *Suidapet drainage*.—Conservancy lanes have not yet been opened up by the District Board and until this is done detailed plans and estimates cannot be drawn up.

Approximate estimates called for by the Sanitary Board for alternative schemes for open drains and closed sewers respectively with a sewage farm at Elliott's Beach were under preparation at the end of the year and have since been submitted with this office No. 191-G., dated 9th March 1914, to the Sanitary Board.

(20) *Tinnevelly-Pulamcottah-Tuticorin joint water-supply*.—Vide item 17 under A above.

(21) *Nandyal water-supply*.—The investigation of a scheme of water-supply for this town will be completed in 1914-15.

(22) *Dhone water-supply*.—Investigation of a source of supply for the town was ordered in G.O. No. 1171 L., Mis., dated 14th July 1913, and was going on during the year.

(23) *Tindivanam water-supply*.—A scheme of water-supply was under preliminary investigation during the year and a report has since been submitted to the Chief Engineer in this office No. 15-G., dated 6th January 1914.

(24) *Valavanur water-supply*.—A preliminary report was submitted to the Chief Engineer by the end of the year—*vide* this office No. 962-G., dated 22nd December 1913.

(25) *Wulajabad water-supply*.—The investigation of a scheme of supply for the town was ordered to be deferred (G.O. No. 1611 L., dated 2nd October 1913).

(26) *Gudiyada water-supply*.—In this office No. 654-G., dated 27th August 1913, a proposal was submitted for orders for investigating at a cost of Rs. 2,100 a pumping scheme of supply from a sandy sub-soil stratum running across the town, the scheme itself being roughly estimated to cost Rs. 70,000. The proposal has been forwarded by the Sanitary Board with its approval to Government in Proceedings No. 655-S., dated 16th October 1913, and orders of Government are awaited.

(27) *Pedupuram water-supply*.—Investigation (at a cost of Rs. 2,500) of the possibilities of obtaining a sub-soil or artesian spring supply for the town was sanctioned in G.O. No. 1340 L., dated 18th August 1913, and was in progress during the latter part of the year.

(28) *Gudalur, Cumbum, Uttarnapalayam and Chinnamunur water-supply (Madura district)*.—The investigation was in progress.

Sanitary works under execution by the Public Works Department.

Berhampur water-works.	Negapatam water-works.
Vizianagram do.	Dindigul water-works improvements.
Masulipatam do.	Kodaikanal water-works.
Vellore drainage.	Madura water-works improvements.
Ellore water-works.	Madura drainage.
Chidambaram water-works.	

Sanitary works under execution by the Sanitary Engineer.

	RS.
(1) Experimental well relating to the investigation of proposals for supplementing <i>Trichinopoly water-supply</i>	8,750
(2) Rajahmundry water-supply investigation—Experimental well at Kovvur	6,600
(3) Kurnool water-works improvements	33,100
(4) Cochin boeing	33,000
(5) Experimental filters at Guindy	36,124
(6) Cuddapah water-works improvements	47,935

Water-supply and drainage systems in operation at the end of the year.

Water-works.

Adoni.	Gudiyattam.	Salem.
Berhampur.	Guntur	Tanjore.
Bezwala.	Kodaikanal.	Tirupati.
Cocanada.	Kurnool.	Trichinopoly.
Conjeeveram.	Madura.	Vellore.
Coonoor.	Nellore.	Vizagapatam.
Cuddapah.	Ootacamund.	Vizianagram.
Dindigul.	Periyakulam.	
		Total 23

Drainage work.

Ootacamund—Total 1.

These works were inspected by the Sanitary Engineer or his assistants and also by the boiler inspection staff in the case of pumping schemes, and Municipal Councils were assisted with advice on upkeep and repairs.

Pumping at water-works.—The following statement gives particulars about the pumping plant on water-works in operation during the year 1912-13.

Statement of particulars about the pumping plant on water-works in operation during the official year 1912-13.

Stations.	Quantity pumped during the year.	Average lift.	Fuel consumed	Description of fuel.	Fuel consumed per 1,000 gallons.	Cost per million gallons raised 1 foot high.	Pump horse-power	Fuel consumed per pump horse-power.	Description of the engines worked.	
									8	9
1	2	3	4	5	6	7	8	9	10	
	gallons.	ft.	tons.		lbs.	Rs. A. P.	lb.			
Beswada	149,320,014	70'88	21.36	Residue oil ..	0.82	0 5 9.95	53.454	0.89	Diesel oil-engines.	
Cocoands	140,160,562	48.37	470.76	Coal ..	7.77	0 12 11.6	34.240	30.79	Compound surface condensing engines.	
Conjeevarain	216,959,736	41.33	232.77	Do.	8.37	1 1 0.98	46.298	39.99	Steam-engine and Crossley gas-engine.	
Gudiyattam	21,358,817	47.11	4.33	Liquid fuel ..	0.682	1 6 8.46	5.132	8.27	Hornsby Akroyd oil-engines.	
Kurnool	111,388,375	45.5	252.47	Wood and liquid fuel.	14.83	1 6 11.95	25,596	64.67	Steam-engine.	Steam and Diesel oil-engines.
Madura	618,453,286	38.44	529.89	Coal ..	0.44	4.56	1.92	1.92	Diesel oil-engine.	
Nellore	102,775,050	67.70	21.53	Kerosene oil ..	0.468	0 18 3	34.777	1.38	Triple expansion engines.	Triple expansion engines.
Tanjore	312,086,812	80.09	640.40	Coal ..	4.59	0 13 3	126.242	22.72	Hornsby Akroyd oil-engines.	Hornsby Akroyd oil-engines.
Trichinopoly main pumping station	175,445,042	95.5	1249.74	Do. ..	4.14	0 11 10	825.783	17.18	Triple expansion engines.	Triple expansion engines.
Trichinopoly sub-pumping station	71,601,381	70.19	295.63	Wood ..	9.24	1 1 11.6	25.382	25.68	Do.	Do.

The following is a statement showing the minor sanitary works dealt with by the Sanitary Engineer from April to December 1913 or for a period of 9 months:—

	Medical institutions.		Latrines		Slaughter houses		Markets.		Wells.		Water-supply.		Drainage.		Miscellaneous.	
	Number	Amount.	Number	Amount.	Number	Amount.	Number	Amount.	Number	Amount.	Number	Amount.	Number	Amount.	Number	Amount.
Estimates below Rs. 2,500.	41	Rs. 61,240	43	Rs. 44,144	4	Rs. 3,210	9	Rs. 12,660	118	Rs. 1,27,826	31	Rs. 33,685	4	Rs. 7,125	44	Rs. 60,590
„ „ „	51	Rs. 318,252	4	Rs. 14,880			4	Rs. 16,647	6	Rs. 22,821	28	Rs. 1,28,069	7	Rs. 29,400	15	Rs. 84,886
„ „ „	30	Rs. 790,550	1	Rs. 11,845	.				1	Rs. 12,750	4	Rs. 64,400	2	Rs. 256,500	18	Rs. 515,804
Total										Rs. 1,62,397	63	Rs. 2,26,104	13	Rs. 13,025	77	Rs. 6,61,260
	122	Rs. 11,76,042	48	Rs. 70,869	4	Rs. 3,210	13	Rs. 29,307	193	Rs. 1,62,397	63	Rs. 2,26,104	13	Rs. 13,025	77	Rs. 6,61,260

Grand total for 9 months—468 works amounting to Rs. 24,22,214.
The grand total for 12 months in 1912-13 was 514 works amounting to Rs. 17,50,754.

Indents.—Indents on the Director-General of Stores were prepared and forwarded during the year for—

Rural water-supply improvements—Semi-rotary pumps and fitter's tools.

Extension of the Vizagapatam water-supply to Waltair.—Pipes, engines and pumps.

Madura drainage.—Iron and stoneware materials connected with the drainage system.

Cochin water-supply.—Steel tubes.

Rural water-supply improvements.—Double barrelled kite-motion pumps, and galvanized iron tanks.

Bezrada Municipality.—Steam road roller.

Anantapur Municipality.—Hornsby oil-engine and Rees roturbo centrifugal pump.

Type-designs.—Type-designs were drawn up and submitted during the year for the following :—

- (1) A combined latrine of six seats.
- (2) Open well fitted with semi-rotary pump.
- (3) Open deep well fitted with pumps and wrought iron tank with taps.
- (4) Revised type-design for a combined latrine of six seats.
- (5) Pail depot.
- (6) Deep well (when maximum water level is very low) fitted with pump, wrought iron tank and taps.
- (7) House connections on water-supply systems with $\frac{1}{2}$ meter.
- (8) Conservancy depot.
- (9) Air valve pit
- (10) Slaughter-house.

Rural water-supply improvements.—During the year the question of improving the rural water-supply systems in those areas which suffered from yearly epidemics of cholera was under the special consideration of Government. It was decided to carry out experiments on a large scale in the matter of protecting village wells and fitting them with semi-rotary pumps or with deep well pumps for the improvement and conservation of the wells. An indent on the Director-General of Stores was sent for the necessary pumps and other articles and part of the supply was received during the year. Government decided that the experiment of fitting wells with pumps should first be tried in the districts of Chingleput, Nellore, Chittoor, North Arcot, South Arcot and Salem and a grant of Rs. 15,000 to each of these districts was made. Towards the end of the year proposals were received from the Presidents of the District Boards of the districts mentioned above and indents were received for pumps and fittings. The experiment has not yet been carried out sufficiently to expect any pronouncement to be made on its probable success. But it is anticipated that the fitting of wells with pumps will become in due course popular and increased interest will be shown by local bodies in

protecting village wells from contamination which occurs under the present system whereby people draw water with buckets from the wells.

In connection with the outbreak of cholera in the Anantapur district, the Government decided that it was necessary to arrange for the improvement of the village water-supply in this district so that the wells would be improved and protected in the earliest possible time.

To enable this to be done the Sanitary Engineer advised that one of his assistants Mr. Gnanaprakasam Pillai should be placed on special duty under his orders and that the attention of this Assistant Sanitary Engineer should be directed entirely to the work contemplated by Government. This proposal was approved at the end of the year and the work of protecting wells in the Dharmavaram taluk in the Anantapur district is now in progress.

Madras Sewage Farm.—During the year, the question of the continuance of the Madras Sewage Farm at Tondiarpet received much attention and, at the request of the Corporation, Government in G.O. No. 825 M., dated 23rd April 1913, were pleased to appoint a Committee with the Sanitary Engineer as Chairman to go into the whole question of the existing sewage farm and to propose means for its improvement. The members of the Committee were Dr. Maitland Gibson, Director, the King Institute, Guindy, Mr. H. C. Sampson, Acting Principal, Agricultural College, Coimbatore, and Mr. W. H. Harrison, Agricultural Chemist, College of Agriculture, Coimbatore. The Committee completed its labours before the end of the year and the report and conclusions of the Committee were forwarded in March 1914 to the Corporation and Government.

Boiler inspection.—During most of the year the staff of Boiler Inspection was short by one Inspector. An additional Inspector was appointed and joined duty in the early part of 1914. The question of the appointment of a Commission to do the work which is now being done by the Sanitary Engineer in connection with Boiler inspection was under consideration at the end of the year and the views of selected owners of boilers were invited.

Sanitary Engineer's staff.—The increase in the staff of the Sanitary Engineer referred to in the last annual report was sanctioned during the year in May 1913. A second Deputy Sanitary Engineer, Mr. E. W. Lace, was obtained from the Public Works Department. Mr. S. D. Shroff was appointed an Assistant Sanitary Engineer and he joined duty on 21st May 1913, *vice* Mr. Harvey who, as reported in last year's report, was transferred to Delhi Imperial Works.

Steps were taken to recruit the necessary draftsmen sanctioned under the scheme. The absence of qualified men available in the Presidency was much felt and a number of posts had to be filled up by unqualified men. The advantage of the increased staff was only apparent for practically the last six months of the year and its full benefit will only be realised at the end of 1914.

The staff now consists of two deputies and four assistants and, in addition, a Personal Assistant to the Sanitary Engineer has been sanctioned. Owing to illness and other reasons the staff was never at its full strength during the year. While the increase in the staff and the division of work of investigation and designing between the Deputy Sanitary Engineers has relieved the Sanitary Engineer from the excessive amount of touring which was formerly necessary, the office work has owing to the increased staff and for other reasons actually increased thus pointing to the desirability of decentralising work as much as possible. The local bodies during the year evinced an increased interest in the formulating of proposals for sanitary works. As most of these required sanction or approval of the Sanitary Engineer the increased number received during the year added greatly to the work in the Sanitary Engineer's office especially when it is remembered that the local bodies still omitted to carry out the requirements in G.O. No. 732 L., dated 26th May 1911, in which Government laid down that all proposals which were intended for execution during any year should be submitted to the Sanitary Engineer before the end of September of that year. As a rule the majority of the proposals are received in the last four months of the calendar year and every local body apparently considers that its work is most urgent and should be given preference over proposals from other bodies. A measure of relief from this

increased work has been obtained by the increase of powers to Local Boards which can now sanction estimates up to Rs. 2,500 provided the proposals are based on type designs. In the case of municipalities these bodies can sanction proposals on a similar condition up to a thousand rupees. The full effect of this relief has not yet been felt, but at the end of 1914 it will be possible to say what further measures are required in order to permit of acceleration in the preparation, scrutiny and sanctioning of sanitary works.

OFFICE OF SANITARY ENGINEER
TO GOVERNMENT, CHEPAUK,
MADRAS, 27th April 1914.

W. HUTTON,
*Superintending Engineer,
Sanitary Engineer to Government.*

Government of Madras.

LOCAL AND MUNICIPAL DEPARTMENT.

Recd. } 1914. *Enclosures*
Regd. } *Spare copies*

G.O. No. 1683 L., 29th September 1914.

Sanitation.

Reviewing the report on — for 1913.

GOVERNMENT OF MADRAS.

LOCAL AND MUNICIPAL DEPARTMENT.

READ—the following paper:—

Proceedings of the Sanitary Board (The 18th Annual Report of the Sanitary Board—1913), No. 703-S., dated 6th August 1914.

Read—the following papers:—

(i)

Letter—from W. HUTTON, Esq., A.M.I.C.E., Superintending Engineer, Sanitary Engineer to Government.
To—the Secretary to Government, Local and Municipal Department.
Dated—Madras, the 12th May 1914.
No.—335-G.

I have the honour to forward herewith for reference six copies, in advance of the 24th Annual report of the Sanitary Engineer to Government, Madras, for the year 1913 which under rule 23 of the Sanitary Board Rules annexed to G.O. No. 1081 L., dated 2nd September 1903, is being submitted by me to the Sanitary Board.

(ii)

Letter from the Sanitary Engineer to Government, No. 350-G, dated 18th May 1914.

(iii)

Letter—from Major W. A. JUSTICE, M.B., C.M., D.P.H., I.M.S., Sanitary Commissioner for Madras.
To—the Secretary to Government, Local and Municipal Department (through the Secretary, Sanitary Board, Chepauk, Madras).
Dated—Madras, the 4th August 1914.
No.—D. 2033-S.

I have the honour to forward herewith my annual Sanitary Report for the year 1913. I very much regret the delay in the submission of the report. Much of the delay is due to the local bodies taking a long time to furnish complete particulars necessary to compile the several statements that are to be appended to the report (G.O. Mis. No. 733 L., dated 17th April 1914). In spite of the orders issued in paragraph 1 of G.O. No. 1936 L., dated 11th November 1913, many of the district and municipal returns were received in this office long after they were due. In some instances the figures shown in the annual returns of local bodies did not tally with the totals of the monthly returns submitted by them. The reconciliation of these figures necessarily takes some considerable time attended with much unnecessary correspondence. Unless local bodies furnish complete and correct figures by the date on which they are due, it is not possible to submit the report to Government so as to reach them on the prescribed date.

Resolution—No. 703-S., dated 6th August 1914.

With reference to rule 23 of the rules relating to the constitution and functions of the Sanitary Board issued with G.O. No. 1081 L., dated 2nd September 1903, the reports read above will be submitted to Government with the report of the Board itself as hereunder. The matter has been delayed by the non-receipt of the Sanitary Commissioner's report, which was not received until so late as 6th August 1914.

The Sanitary Engineer's previous report having been submitted for the official year 1912-13 instead of for the calendar year 1912, his present one covers only the period 1st April 1913 to 31st December 1913.

2. The constitution of the Board continued to be the same but its powers of final approval have been raised under G.O. No. 1000 L., dated 14th June 1913, in respect of the maximum limit of the estimated cost of schemes, from Rs. 10,000 to Rs. 20,000.

3. The Hon'ble Mr. C. A. Smith was President of the Board from January to October 1913, the Presidentship in the interim having been held by the Hon'ble Mr. S. D. Pears. There was no other change in the personnel.

An addition of one typist and one attender has been made to the Board's office establishment under the orders of Government conveyed in G.O. No. 1515 L., dated 20th September 1913.

4. During the year, the undermentioned designs were approved by the Board as types and circulated with schedules and specifications for adoption by local bodies:—

- (1) Out-patient dispensary for women and children (type design No. 140).
- (2) Sub-Assistant Surgeon's quarters (type design No. 141).
- (3) Phthisis ward of twelve beds (type design No. 142).
- (4) Details of shutters in Phthisis ward (type design No. 143).
- (5) Open well with semi-rotary pumps (type design No. 144).
- (6) Closed deep well with pump and iron tank (or masonry reservoir) with taps (type design No. 145).
- (7) Quarters for a Civil Apothecary or Assistant Surgeon (type design No. 146).
- (8) Epidemic disease shed (type design No. 147).
- (9) Out-patient dispensary for small towns (type design No. 148).
- (10) Latrine for this dispensary (type design No. 148A).
- (11) Store and kitchen for this dispensary (type design No. 148B).

5. The more important of the sanitary schemes which were approved by the Board during the year were the following:—

		RS.
(1)	Madura water-works improvements	5,68,800
(2)	Erode water-supply	3,99,000
(3)	Negapatam drainage	3,30,000
(4)	Tirupati water-supply	2,55,000
(5)	Chingleput water-supply	2,00,000
(6)	Combined hospital for Tinnevelly and Palamcottah	1,87,200
(7)	Hospital building at Bellary	1,63,000
(8)	Narasaraopet water-supply	1,31,000
(9)	Coonoor water-supply	93,170
(10)	General hospital for women and children at Dindigul	48,210
(11)	Compound wall for the municipal burial ground at Vellore.	46,000
(12)	Hospital building at Negapatam (revised estimate)	43,170
(13)	Relieving congestion in the bazaar at Ootacamund	27,000
(14)	Improvements to the municipal hospital at Srirangam	26,898
(15)	Diversion of drainage at Peddapur and improvements to its water-supply	26,600
(16)	Hospital buildings at Periyakulam	23,745
(17)	Out-patient dispensary and store-room at Conjeeveram	14,500
(18)	Dispensary building at Kosigi	13,000
(19)	Out-patient dispensary at Uttaramerur	12,800
(20)	Improvements to the fresh water tanks at Pattaraikulam and Muthupet	12,600
(21)	Dispensary building at Nagalapuram	12,320
(22)	Out-patient dispensary at Tiruchendur	11,900
(23)	Hospital building at Yercand	11,800
(24)	Out-patient dispensary at Kulasekharapatnam	11,200

6. The total number of schemes approved by the Board during the year was 96 estimated to cost Rs. 32,12,712 in the aggregate. Of these, 42 schemes estimated to cost Rs. 27,67,426 related to Municipalities, and 54, estimated to cost Rs. 4,45,286, related to Local Boards.

7. Seventy-three of these schemes, estimated to cost Rs. 5,50,989 in the aggregate, were within the Board's powers of final approval, and of these, the following seven works costing Rs. 94,204 are reported to have been completely executed before the close of the year 1913 :—

	RS.
(1) Sub-artesian water-supply, Kumbakōnam	8,100
(2) Lady medical officers' quarters at the Gosha hospital, Vizagapatam	9,200
(3) Construction of drains at Dindigul	4,700
(4) Relieving congestion in the union of Mettupālaiyam	6,652
(5) Water-supply, Vizagapatam	5,182
(6) Relieving congestion in the union of Gobichettipālaiyam	17,200
(7) Hospital buildings at Negapatam	43,170

8. Thirty-one works estimated to cost Rs. 2,14,885 were under execution at the close of the year, namely :—

	RS.
(1) Rock Fort water-supply at Trichinopoly	7,169
(2) Salt fish godown at Dindigul	2,600
(3) Out-patient dispensary at Badvel	10,000
(4) Scavengers' huts at Chidambaram	9,100
(5) Dispensary building at Tirupporur	9,600
(6) Out-patient dispensary at Melapālaiyam	10,000
(7) General female ward, Kotagiri	8,300
(8) Improvements to a drinking-water pond at Kandanakunthi.	4,080
(9) Hospital main ward at Mettupālaiyam	9,200
(10) Drains from Bandara road to the fish pond at Vizagapatam.	5,480
(11) Improvements to the drinking-water tank at Sollapuram ..	2,900
(12) " " at Nallabariamma-puram	3,450
(13) Isolation ward at Alur	6,200
(14) Out-patient dispensary at Vempalli	10,000
(15) Vaccine depot at Tiruppattur	3,700
(16) Compound wall at the weekly market at Kallur	8,730
(17) Drains in Kona:ajapuram	4,300
(18) Out-patient dispensary at Owk	7,200
(19) " at Cuddapah	5,000
(20) Bandypettah at Mettupālaiyam	11,470
(21) Kona conduit at Udayagiri	5,000
(22) Construction of drains in the east and south of Tiruvadi ..	3,470
(23) Construction of a ward in the hospital, Dhārapuram ..	9,080
(24) Construction of three market sheds at Velpur	3,594
(25) " of a well with pump and cistern at Angadi-puram	3,240
(26) Construction of an operation room at Chidambaram ..	5,210
(27) Out-patient dispensary at Gudur	12,210
(28) Scavengers' huts at Gogai	17,572
(29) Extension of Udumalpet union	15,000
(30) Construction of a compound wall round the hospital building at Tadpatri	2,730
(31) Construction of plague camps at Vāniyambādi and Pudupet toll-gates	4,300

9. Eighteen works estimated to cost Rs. 1,29,145 were awaiting settlement of questions under correspondence (land acquisition, settlement of site, etc.):—

	RS.
(1) Out-patient dispensary at Arantangi	7,500
(2) New out-patient dispensary at Avanashi	6,800
(3) Construction of a flood bank and two automatic sluices for the drains at Amaravati	7,200
(4) Construction of a ward of six beds at Dindigul	4,060
(5) Endowed tank at Yeddanapadi	3,760
(6) Improvements to the Pillai tank at Chatrapur	4,800
(7) Dispensary building at Melaviraraghavapuram	14,460
(8) Draw-well at Jampeta	2,940

	RS.
(9) Construction of a European and surgical ward at Chittoor ..	7,280
(10) Isolation ward for small-pox and cholera patients at Negapatam	13,895
(11) Construction of two nurses' quarters at Tanjore	7,100
(12) Improvements to the drinking-water tank at Kakirampalli	4,610
(13) Improvements to the Sittarai tank at Tanjore	4,050
(14) " to Tamaiakulam at Tanjore	4,460
(15) " to Arasoor tank at Tanjore	5,550
(16) Construction of a hospital at Punachi	12,800
(17) Construction of quarters for the Sub-Assistant Surgeon at Nagore	2,900
(18) Construction of a ward of twelve beds in the municipal hospital at Parlakimedi	12,080

10. Seven works estimated to cost Rs. 72,385 were deferred pending allotment of funds, which could not be arranged for in 1913-14:—

	RS.
(1) Bullocks slaughter-house at Mettupalaiyam	2,800
(2) Providing compound walls and tiled sheds in the burning and burial-grounds at Mayavaram	18,280
(3) Relieving congestion in Nellore	8,890
(4) Construction of a dispensary at Manambuchavadi	13,200
(5) Construction of a dispensary at Ammapet	9,730
(6) Acquisition of a site for the extension of Jampeta market, Rajahmundry	5,729
(7) Acquisition of Edigagudam to the east of Symalamba road, Rajahmundry	13,756

11. Seven works estimated to cost Rs. 25,120 have since been abandoned in favour of revised proposals:—

	RS.
(1) An isolation ward for septic and dirty cases at Tenali	2,700
(2) Dispensary building at Lalavadi	10,000
(3) Drinking-water supply for Tsodur village	2,600
(4) Improvements to the out-patient dispensary and Sub-Assistant Surgeon's quarters at Sripurumbudur	2,450
(5) Out-patient dispensary at Sembiyam	11,500
(6) " " at Perundurai	10,250
(7) Site for the formation of a railway town at Ambattur	25,000

12. Three works estimated to cost Rs. 15,250 were reserved for execution as famine-relief works:—

	RS.
(1) Filling up ditches at Kolalu	5,000
(2) " " at Hirigadahalli	6,000
(3) Construction of a reservoir at Vishukayalupalli	4,250

(True Extract.)

W. G. MOLESWORTH,
Secretary, Sanitary Board.

To the Secretary to Government, Local and Municipal Department
(with the reports of the Sanitary Engineer
and the Sanitary Commissioner).

,, Sanitary Commissioner for Madras.
,, Sanitary Engineer to Government.

Copy to the Chief Engineer, Public Works Department.

Order—No. 1683 L., dated 29th September 1914.

The report of the Sanitary Engineer, which covers the period from 1st April to 31st December 1913, was submitted to the Sanitary Board only on the 18th May, and that of the Sanitary Commissioner, which relates to the calendar year 1913, was sent in so late as the 6th August 1913. These two reports were forwarded to the Government by the Sanitary Board with its resolution on the 22nd August. The Sanitary Commissioner again attributes the inordinate delay to the late receipt of the district and municipal reports. The importance of the punctual submission of these

was impressed on Collectors and Presidents of District Boards in G.O. No. 1936 L., dated 11th November 1913, and their attention will again be drawn to the matter.

2. *Rainfall and prices of food grains.*—The total average rainfall was 2·55 inches less than that of the preceding year, but the prices of the staple food-grains, though much above the average, remained almost stationary in all the districts.

3. *Birth-rate in rural areas.*—Vital statistics were returned from the same areas as in the previous year. The birth-rate as a whole was 32·2 per mille, or 1·3 more than in the year preceding, and (excluding Madras City) ranged between 38·7 in Guntūr district and 25·4 in Rāmnād. The most striking variation was in Ganjām where the rate advanced from 18·2 to 30·4 per mille.

The registration of vital statistics was compulsory in 279 unions and 1,898 non-union villages; the birth-rate there was 31·8 per mille as compared with 31·9 per mille in non-compulsory areas. In only ten of the 21 districts where registration was compulsory were the rates in compulsory areas above those in non-compulsory tracts; the excess was most marked in Salem (+ 22·1), while Kurnool and Kistna showed the largest decrease. The attention of the Collectors concerned will be drawn to the remarks of the Sanitary Commissioner regarding the inefficiency of the registering agency in the towns referred to in paragraphs 13 and 23 of the report.

4. *Death-rate in rural areas.*—The general death-rate fell from 24·3 to 21·4 per mille partly in consequence of decreased mortality from cholera and fevers, but an increase occurred in the districts of Rāmnād (+ 1·1) and the Nilgiris (0·4). Among the other districts the decrease was most marked in Cuddapah (— 12·4) and in Bellary (— 11·7) where the death-rate (35·2) was the highest in the Presidency in 1912. The district figures varied from 26·5 per mille in Malabar to 16·9 in Gōdāvari. The rate in compulsory areas (21·1 per mille) was higher (by 0·5 per mille) than in tracts where registration was voluntary.

5. *Birth and death-rates in municipal areas.*—The recorded birth-rate rose in 41 municipal towns, particularly in Adōni (+ 22·9), Bellary (+ 10·0) and Vāniyambādi (+ 10·0) and declined in 21, noticeably in Gudiyāttam (— 8·7), Tiruppattūr (— 8·4) and Cocanada (— 8·3). Decreases were apparently due to defective registration and the attention of the councils concerned will be drawn to the matter.

The death-rate in municipalities again fell from 34·0 to 31·9 owing to fewer deaths from cholera and fevers. An increase occurred in 17 towns—most marked in Tiruppattūr (+ 14·7), Coimbatore (+ 12·8) and Palni (+ 12·2)—while the chief declines were in Vāniyambādi (— 38·8) and Gudiyāttam (— 35·0) both of which returned the largest increases in 1912.

6. *Infantile mortality.*—A drop in infantile mortality occurred both in municipal (— 9·4) and rural (— 10·4) areas, the rates of mortality having averaged 238·8 per mille in the former and 180·0 per mille in the latter. The municipal rate was highest in Palni (335·9) and Guntūr (319·3). Among rural areas, Chingleput (214·3) had the worst record and was followed by Tanjore, South Arcot and Tinnevelly, in all of which the rate exceeded 200 per mille. As compared with the previous year, the most noticeable variations in towns occurred in Hospet (+ 113·2) and Masulipatam (— 124·9), and among the districts in North Arcot (+ 23·9) and Ganjām (— 39·9).

7. *Fevers.*—“Fevers” continued to be the chief classified cause of death and accounted for 6·7 per mille (or nearly a third of the total) of the deaths from all causes. In rural tracts the figure was 7 and in town circles 4·6. The rate was particularly high in the districts of Vizagapatam (15·3), Ganjām (12·8), Kurnool (11·6) and Guntūr (10·5) and in the municipal town of Kurnool (15·6).

Major T. S. Ross, I.M.S., and Captain J. H. Horne, I.M.S., continued to be in charge of the malaria operations in the Presidency. During the year, the former conducted investigations at Cumbum and Siddapuram in the Kurnool district, Waltair and Koraput in the Vizagapatam district and Kallichedu in the Nellore district and in the Lower Palnis (Madura district) and the Anamalais (Coimbatore). He also supervised the progress of the anti-malarial operations at Ennore.

Captain E. C. Hodgson, I.M.S., was appointed special malaria officer for the City of Madras, and under his guidance anti-malarial operations were conducted on a large scale in the city. In aid of them the Government sanctioned a grant of one lakh of rupees in 1913-14 and have made a further grant of three lakhs in the current year.

Captain Horne conducted a stegomyia survey of the ports of Madras, Negapatam and Tuticorin and investigated the practicability of starting an anti-mosquito campaign in the Wynnaad, a specially malarious area. He also held classes of instruction for assistant surgeons and sub-assistant surgeons to be detailed respectively for the stegomyia survey and the charge of travelling dispensaries.

8. *Cholera*.—The mortality from cholera dropped from 2.3 per mille to 0.9 per mille. The disease appeared in every district, being severe in Anantapur (4.7) and Tanjore (2.5) and in 43 municipalities, the total mortality in the latter being 0.7 per mille against 1.8 in 1912. The town worst affected was Palni (19.0).

From statement XIII appended to the Sanitary Commissioner's report it appears that in eighteen municipal towns in which a protected water-supply has been in existence for more than five years, the number of deaths from fever during the last five years was on an average 16.4 per cent. of the total mortality against 24.7 during the quinquennium preceding the date of introduction of the water-supply, while the number of deaths from cholera was 2.5 per cent. in the later against 8.1 per cent. in the earlier period.

9. *Small-pox*.—Small-pox occurred in all districts. The mortality from it fell slightly, though the ratio per mille remained at 0.4. Coimbatore again returned the highest death-rate (1 per mille) under this head. Seventeen municipal towns escaped the disease and in nineteen towns the number of reported deaths did not exceed four apiece. The death-rate exceeded two per mille in Guntur (2.6) and Mannargudi (2.3). In urban areas, where vaccination was generally compulsory, the death-rate was 0.3 against 0.4 in rural tracts. Nearly one-half the number of deaths from small-pox occurred among children under one year of age and about one-third among children aged from one to ten years. During the year under review the Government decided against the extension of what was known as the "trial scheme" of vaccination, the essential features of which were the simultaneous enforcement of the compulsory registration of vital statistics and of compulsory vaccination and the employment of better-trained vaccinators and deputy inspectors of vaccination on enhanced scales of pay, as it was considered that neither compulsory registration nor compulsory vaccination could, for the present, be introduced with advantage in a large proportion of the rural areas.

10. *Plague*.—The number of deaths from plague fell from 6,651 to 5,130. The rate was highest in Coimbatore (1.0 per mille). In the other sixteen districts visited by the disease it exceeded 0.6 only in North Arcot, where it was 0.9. Among municipal towns, Tiruppattur (44.3 per mille) was the worst sufferer. Next came Coimbatore with a death-rate of 12.7 per mille. The preventive and remedial measures adopted were substantially the same as before. Since the close of the year, however, the passport system has been replaced by the notification system.

11. *Dysentery and diarrhoea*.—The mortality from these fell from 1.8 and 5.6 per mille to 1.6 and 5.4, respectively, in rural and urban areas. In rural areas the Nilgiris (4.8) and Malabar (3.9) recorded the highest death-rates, as in the previous year, and among municipal towns Madras (10.2), Periyakulam (9.7) and Calicut (9.2).

12. *Sanitary works—Civil—I. Municipal areas*.—During the year a piped water-supply was completed in Vizianagram and was nearly finished in Berhampur and Kodaikanal, the number of towns possessing such supplies thus rising to 23. A partial supply continued to be in operation in Kumbakonam from a sub-artesian source.

Draft rules regulating schemes for town extensions and the provision of house accommodation undertaken by municipal councils were confirmed during the year, and instructions were issued for the disposal of rubbish by screening and incineration. The Government also published for criticism draft rules for the guidance of councils in granting licenses for the construction of buildings and huts. These rules have since been confirmed. The Government have further enunciated the general principles to be observed by municipal councils in the organization of their conservancy staff and have impressed upon local bodies the necessity for disseminating among the people a knowledge of the dangers caused by flies to the health of the community. The

attention of all municipal councils is drawn to paragraphs 62 and 64—69 of the Sanitary Commissioner's report regarding the disposal of sewage, rubbish and night-soil and the duties of sanitary inspectors and overseers.

To improve the sanitary services, the Government of India have sanctioned the appointment of two additional Deputy Sanitary Commissioners and the employment of health officers of the first class in twelve municipal towns and of the second class in nineteen others. One of the additional Deputy Sanitary Commissioners was appointed during the year. The scheme for the appointment of health officers could not, however, be given effect to pending the receipt of a reply from the Government of India to a reference made to them on the question of the enhancement of the subvention from Imperial to Provincial revenues towards the improvement of the sanitary services in this Presidency.

II. Rural areas.—The improvement of rural water-supplies received much attention. Each of the districts of Chingleput, Nellore, Chittoor, North Arcot, South Arcot and Salem was given a grant of Rs. 15,000 from Provincial funds for the conduct of experiments with closed-in wells fitted with pumps, the object being to ascertain, among other things, how far the ordinary village agencies, with the assistance of travelling mechanics to be appointed in each district, would be able to keep in working order the semi-rotary pumps fitted to these wells. If the experiment is a success, it will be extended. Further grants amounting to Rs. 2,86,000 were also made to District Boards to enable them to take systematic action in the direction of providing at least one satisfactory source of drinking-water in every village with a population of 500 or over. An Assistant Sanitary Engineer was also placed on special duty for the improvement of the drinking-water supply in the rural tracts of the Anantapur district where there had been a severe epidemic of cholera. The Government have also sanctioned the creation of two mobile reserve parties of ten sanitary inspectors, each under the charge of an assistant surgeon, in order to check the spread of outbreaks of cholera. These hold themselves in readiness to proceed at short notice to any area affected with the disease.

13. Imperial and Provincial grants in aid of sanitation.—During the year a Provincial grant of 20 lakhs was distributed among local bodies for expenditure on sanitary works. This amount included the customary allotment of Rs. 3·50 lakhs from Imperial funds. The principal objects for which the subsidy was given were, as usual, schemes for the opening up of congested areas, the acquisition and laying out of town extensions and the improvement of rural water-supplies. During the year the Government of India sanctioned a special non-recurring grant of Rs. 27 lakhs and a recurring grant of Rs. 6 lakhs for expenditure primarily on urban sanitary works in this Presidency. A sum of Rs. 4·43 lakhs was spent up to 31st March 1914 from the recurring grant on the objects set out in paragraph 76 of the Sanitary Commissioner's report. No expenditure, however, was incurred from the non-recurring grant.

14. The King Institute.—The King Institute of Preventive Medicine at Guindy continued to do useful work during the period under report. The quarterly analysis of samples from the water-supplies of municipalities and jails conducted in the Institute was temporarily suspended during the year in order to enable the Director to test the new sand and mechanical filters which have been erected in the grounds of the Institute by the Sanitary Engineer and to review thoroughly the results of the previous quarterly analysis.

Since the close of the year the Government have sanctioned the installation of a Mather and Platt gravity filter in addition to the existing mechanical filters at the Institute and have appointed a committee to consider and report how the methods of analysis of water now adopted may be simplified.

15. Execution of sanitary projects.—The water-works at Berhampur, Vizianagram, Kodaikanal, Masulipatam, Ellore, Chidambaram and Negapatam and the drainage works at Vellore and Madura were under execution by the Public Works Department which was also engaged in carrying out improvements in the existing water-works at Dindigul and Madura. The water-works at the first three of the above towns were either completed or nearly finished before the end of the year. The

Sanitary Engineer was in charge of the execution of the experimental well in connection with the proposed water-supply scheme for Rajahmundry, of the artesian boring operations at Cochin, of the experimental filters at Guindy and of the improvements to the existing water-supply systems at Kurnool, Cuddapah and Trichinopoly.

16. *Investigation of sanitary projects.*—Among the chief schemes under investigation during the year under report were those for the drainage of Kumbakōnam, Salem, Calicut, Chidambaram, Rajahmundry, Parlākimedi and Periyakulam and for the supply of water to Kumbakōnam, Coimbatore, Tiruvannāmalai, Devakkōtai, Sivaganga, Ongole, Rajahmundry, Rāmnād, Calicut, Parlakimedi, Nandyāl, Cochin, Mangalore, Mannārgudi, Dhōne, Tindivanam and Peddāpuram. Besides inspecting existing water-works and advising as to their maintenance, the Sanitary Engineer prepared ten type-designs and checked and scrutinized plans and estimates for 463 works of which 292 (being for amounts of less than Rs. 2,500 each) came within his powers of sanction, while 56 were for amounts exceeding Rs. 10,000 each. The power of according professional sanction to estimates for sanitary and other works undertaken by local bodies was raised during the year to Rs. 10,000 in the case of the Sanitary Engineer. Since the close of the year, local boards have been empowered, as a measure of decentralization and of relief to the Sanitary Engineer, to sanction estimates for sanitary works up to Rs. 1,000 or up to Rs. 2,500 when they follow a type-design.

To afford some relief to the Sanitary Engineer a second Deputy Sanitary Engineer and two Assistant Sanitary Engineers were sanctioned for a period of two years in the first instance; and his drawing and clerical establishments have also been strengthened.

17. *Presidency town.*—In the City of Madras the conduit for conveying water from the Red Hills lake to the town was completed and the filter-beds and the pumping station and elevated tank at Kilpauk were nearly finished. Eleven of the filters were tested. To meet the demands of the probable further increase in the population in the next few years, the Government have since sanctioned the construction of seven additional filter-beds and a fourth pure water tank, but these works are not to be undertaken without further orders from the Corporation after experience has been gained of the pace at which the existing filters work and the consumption of water per head throughout the city. Pipe-laying on two of the mains connected with the water-supply distribution scheme was in progress as also experiments for the waste-water detection system. Contract forms were also prepared for the several works connected with the scheme but the tenders offered have not yet been accepted by Government owing to the large variations from the specifications in the tender accepted by the Corporation. On the drainage section, the laying of sewers in Tondiarpet and the three pumping stations there were completed, while the estimates for the main drainage scheme for the city were under the scrutiny of the Public Works Department. The estimates were subsequently revised by the Corporation with reference to the remarks of the Chief Engineer and are now with the Public Works Department. The Corporation has, however, been permitted to put in hand some of the more urgent works included in these estimates.

At the instance of the Corporation, a committee was appointed to consider and report whether the sewage farm at Tondiarpet was a source of malaria in the neighbourhood. The committee was of opinion that although the prevalence of malaria could not be traced to the sewage farm, it was desirable to move it further north. The question of acquiring a new site for the farm is now under consideration and the Government have sanctioned a grant of Rs. 1,25,000 for the purpose.

18. *The Sanitary Board.*—The constitution of the Sanitary Board underwent no alteration, but its powers of final approval have been raised, in respect of the maximum limit of the estimated cost of the schemes, from Rs. 10,000 to Rs. 20,000. The Board approved plans and estimates relating to 96 sanitary works estimated to cost over 32 lakhs in the aggregate; 73 of these, costing 5.51 lakhs, were within its own sanctioning powers and of these, 7 were completed during the year and 31 others were under execution at its close. Among the standard designs issued during the year were those for (1) an out-patient dispensary for women and children, (2) quarters for assistant and sub-assistant surgeons, (3) well water-supply arrangements and (4) an out-patient dispensary for small towns.

19. *Sanitary service.*—Since the close of the year the Government have sanctioned a special course of training for health officers of the second class for mufassal municipalities and sanitary assistants to the District Medical and Sanitary Officers.

(True Extract.)

W. FRANCIS,
Ag. Secretary to Government.

To the Sanitary Board.
" the " Engineer.
" the " Commissioner.
" the Surgeon-General.
" the Public Works Department.
" the Public Department.
" the Revenue Department.
" the Assistant Quartermaster-General (with C.L.).
" the Inspector-General of Police.
" the " of Prisons.
" the Accountant-General.
" the Director of Public Instruction.
" all Collectors.
" all Presidents, Districts Boards.
" all Chairmen, Municipal Councils.
" the President, Corporation of Madras.
Editors' Table.

